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# Soviet Union

## FOREIGN MILITARY REVIEW

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# SOVIET UNION

# FOREIGN MILITARY REVIEW

No 1, January 1987

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Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 3-6

[Editorial on the 69th Anniversary of the Soviet Army and Navy]

[Text] There are many glorious memorable dates and events in the historical chronicle of our people. Among them is the birthday of the Soviet Armed Forces, which are 69 years old on February 23, 1987.

Based on continous good tradition, the Soviet people mark this day as a great and joyous national holiday thereby expressing their deep recognition and respect to the armed defenders, the reliable and loyal guards of the achievements of the Great October, socialism and peace. Along with us, workers and service personnel of other socialist countries, our friends and commrades-in-arms abroad widely and solemnly celebrate this date.

This year, the 69th anniversary of the Army and Navy, our country is encountering a great turn in the development of all Soviet society; a turn, started and being directed by the Communist Party based on the decisions of the April (1985) Plenum of the Central Committee and the programmed directions of the 27th CPSU Congess. The ensuing revolutionary restructuring in our society is already yielding fruitful results.

The results of the first year of the 12th Five Year Plan confirm this. They clearly testify to the growing dynamism in economic development. The highest growth rates in national income and industrial output in this decade have been achieved. The work of key brances of industry, that of metallurgy, the coal and gas industry, and transportation improved signficantly. Labor productivity reached a higher than established level and expenditures for the unit of product were reduced more than that which was outlined.

The agricultural workers began to rejoice. The gross grain yield was almost 210 million tons, which exceeded the mid-year volume of grain output in the previous Five-Year Plan by 30 million tons.

The problems of social development are being dynamically solved. The number of homes, schools, preschool child centers, polyclinics, hospitals and sporting buildings have increased noticeably and their quality improved. The health

service, and the realm of domestic and community service are being improved. Democracy in our society is deepening. The changes in its moral-political climate are tangible. The mood and rhythm of life itself of the Soviet people is changing. All these are gratifying and welcome changes.

The Soviet military men live with common thoughts and strivings with the country's workers. The results of the first year of 12th Five-Year Plan make them happy and inspire them. They are participating actively in the growth process of the revolutionary restructuring of Soviet society. It cannot be any different. In characterizing our army, its creator and organizor, V. I. Lenin said, that it must not lose touch with the people, but must be closely connected with them, and what the army is called upon to defend are the achievements of the revolution, our people's power, the Soviets of the soldiers', workers' and peasants' deputies, all the new and the truly democratic order from all the ememies of the people. And from the day of its birth, our Army and Navy has carried out and will continue to carry out its high purpose with honour and dignity.

The civil war and the conflict with foreign interventionists showed this convincingly. The devotion to communist ideals, the unprecedented steadfastness, the selflessness, and courage of the first defenders of the October, astonished and enraptured the entire world, found the deep gratitude of our country's workers, and were highly valued by the party. As was said in the welcome speech of the 9th Party Congress to the Red Army and Red Navy, "the Russian people will never forget your feats and sacrifices, and the workers of the entire world will not forget them." They saw then throughout the entire world that a new type of army was born, which differs in essence from the army of an exploitative society where the armed forces were always and continue to be the weapon of oppression against the workers, used by the aggressive policy of the ruling classes, and the capture and enslavement of other countries and peoples.

Our armed forces covered themselves with everlasting glory during the severe years of the Great Patriotic War. The powerful insidious and treacherous enemy brought down a strike of unprecedented power on the USSR. But our Army and Navy, lead and guided by the Leninist party and leaning on the mighty support of all the people, not only endured this strike, but plunged the monstrous Hitlerite military machine into the earth and befittingly fulfilled their patriotic and international mission. 607 enemy divisions were destroyed or captured on the Soviet-German front. This fact alone eloquently speaks of the scales of combat with fascism, and the power of the courage and the combat mastery of Soviet troops.

The Soviet people and its renowned troops achieved a great victory. The heroism was truly national and wholesale. More than 7 million Soviet soldiers, representatives of all service arms, the sons and daughters of all nations and the peoples of our country, were awarded with orders and medals for courage displayed on the battlefields. More than 11,630 of the bravest received the title Hero of the Soviet Union. Almost three fourths of them were communists. Every fourth soldier at the front was a party trooper. More than 10,900 times during the war years, soldiers were decorated with regimental and divisional orders, many of them repeatedly. The highest courage of Soviet soldiers, for

whom there was no price but the freedom and independence of the Homeland is cut from each of these statistics. During the Great Patriotic War, the conclusion was unquestionably confirmed once again, that the power of a socialist country's armed forces lies in their class-proletarian origin and social character, in the leadership of the Marxist-Leninist party, and in the unity and solidarity with the people.

The Soviet people take pride in the immortal glory of the soldiers of our Armed Forces, their valour and merits during the years of heavy trials. Their mass heroism, fearlessness and military courage when locked in mortal combat with the enemy, is not only the property of history, but a great example of life and the struggle for new generations of armed protectors of the socialist Fatherland. The sons and grandsons of those, who, to their death, stood before the walls of Moscow and Leningrad, who lead the combat path from Stalingrad to Berlin imitate them in their fate. The present defenders of the people demonstrate their fidelity to the heroic traditions of the army and people through selfless military labor, masterfully controlling complex combat equipment, missile complexes and radioelectronic systems, atomic submarines and supersonic aircraft. And, when the Motherland requires and international duty calls, they carry out the exploits worthy of the glory of the fathers and uncles.

The fulfillment of the patriotic and international duty in Afghanistan by Soviet soldiers is a clear example of this. In helping the DRA's armed forces in the struggle with the hirelings of imperialism, the oppressors, many of them display the standard of fearlessness, selflessness, heroism and fortitude. Already scores of soldiers have been awarded the highest and most honorable title, Hero of the Soviet Union. Many soldiers, sergeants, warrant officers, and officers have been decorated with Soviet and Afghan orders and medals for heroism and bravery displayed while carrying out military duty. That the combat baton is placed in reliable hands is splendid testimony of the succession of the combat glory of the fathers and uncles.

Another example speaks of this.

A great misfortune has occurred. An accident occurred at the Chernyoble nuclear power plant. A complex situation unfolded there. Pressing, urgent and heroic actions were necessary to eliminate properly the consequences of the accident. And Soviet troops were in the first ranks during this difficult situation. All who participated in the complex and dangerous operation to curb the "revolting" atom displayed genuine courage and bravery in executing the high patriotic duty.

The main thing is that our soldiers direct their efforts, enthusiasm and energy to insure high vigilance and constant combat readiness, exemplary troop discipline and self-discipline. The experience of history and the modern international situation dictates the necessity of this.

Recently, imperialism, above all American imperialism, has made desparate attempts to change, in its favor, the military-strategic balance which has been established, and to achieve military superiority over socialism. For this purpose, the reactionary imperialistic circles, above all those of the United

States of American, are supercharging international tension in various regions of the world; escalating the arms race, always at great rates; and continuing to intensify efforts in modernizing strategic offensive forces. Qualitatively new armament systems, including the MX, MIDGETMAN, and TRIDENT-2 ballistic missiles, are being developed and rolled out in the U.S. The deployment of the first-strike PERSHING-2 nuclear missiles has been completed in the FRG. The deployment of ground-launched cruise missiles is continuing in a number of West European countries.

The U.S. military command is pinning special hopes on the implementation of the "Star Wars" program, the so-called Strategic Defense Initiative (SDI). Not having been able to achieve military superiority over the USSR on earth, American imperialism, resting on new technology and economic power, is trying to acquire the military advantage in outer space. In this case, space is considered to be the last frontier, where it is possible to take historical revenge in the competition of two social-economic structures. In other words, the role of the most important and favorable staging ground of aggression is given to space.

But the failure and illusion of the hopes for the achievement of any kind of superiority, military or political, over the Soviet Union is evident. The USSR is not a country to which it is possible to speak from a position of force. If the U.S. implements SDI, this threat, as comrade M. S. Gorbachev has repeatedly emphasized, will not be without a response. The Soviet Union will adopt appropriate measures to insure its own security.

The USSR possesses an enormous scientific-technical and economic potential and is able, if necessary, to respond properly to the American challenge. But our country is against such a choice. We are against the absurd American logic of arms. It is not a problem of fear for the Soviet Union to ban space strike weapons, but rather a question of responsibility, the responsibility for the fate of the world which must not become a hostage to SDI.

Namely, having been guided by the consciousness of the responsibility for the world's fate, during the Soviet-American conference in Reykjavik, comrade M. S. Gorbachev introduced an aggregate of proposals for the radical normalization of the situation on our planet. And, had these proposals been adopted, mankind would be able to breath freely. Unfortunately, the Washington administration sacrificed the interests of peace to the U.S. military-industrial complex which is earning incredible profits on the orders of SDI components.

Specialists calculate, that the total cost of SDI deployment is estimated to be almost two trillion dollars. The monopolists competing for a share of these millions, as the same Americans emphasize, have ceased to think about international peace. For them, the main issue are the plans to militarize space, which will ensure orders and enormous profits for the next 30 years. This is why the U.S. military-industrial complex was so scared by the prospects of disarmament outlined in Reykjavik.

Striving to break the military parity between the USSR and the U.S. and to insure itself military superiority, Washington started by breaking the SALT-2

Treaty which has limited the nuclear arms race for a number of years to its central direction, the realm of strategic offensive weapons. In December, 1986, the U.S. additionally introduced into combat the 131st Heavy Bomber, equipped for long-range cruise missiles, but did not dismantle any kind of nuclear weapon carriers as compensation.

The CPSU is thoroughly analyzing and assessing the new trends and phenomena in the military-political strategy of American imperialism and drawing the appropriate conclusions. In combining adherence to principles and flexibility in its approach to foreign political problems, the Soviet Union is proposing newer and newer practical initiatives, directed at curbing the arms race and preventing military experiments in space, and also nuclear tests. Only one list of suggestions for the improvement in the international climate introduced by our country in recent years for the purpose of achieving progress in the sphere of military disarmament, convincingly shows the steadfast and consistency of the peaceloving course proclaimed by October.

The adoption during M.S. Gorbachev's visit to India of the "Delhi declaration on the principles for a world free of nuclear weapons and not violent," was new testimony to the Soviet Union's striving for a solution to the main problem of how to rescue mankind from nuclear death. On behalf of more than a billion people, comprising the population of two nations, the USSR and India turn to the people and the leaders of all nations with the call to undertake decisive measures which will lead us to peace without weapons of mass destruction and without war.

In the present complicated international situation, the Soviet Armed Forces must maintain constant high vigilance and combat readiness. Our defensive doctrine, formulated in the 27th Party Congress, proclaims: "The Soviet Union does not want great security for itself at the expense of others, but at no time will it agree to less. This costs a great deal in resources and forces, but a threat exists of an encroachment on the achievments of the October, and to the entire world, and we will strengthen our armed forces further and allocate what is necessary for the defense of the country.

All the components of the Soviet nation's defensive power are a concentrated manifestation of the qualitative character of the Soviet Armed Forces, their combat potential, which represents a strong alloy of military mastery and high technical equipping, ideal steadfastness, self-discipline and the discipline of the personnel, its fidelity to patriotic and international duty. The activities of the commanders, political organs, party organizations, and men of the Army and Navy are directed at increasing combat readiness. All are done so that no turn of events is unexpected or finds us unaware. The process of equipping our armed forces with modern weapons and combat equipment does on. The search for new methods and forms of armed conflict is being carried out. The training of officer cadres is being improved. The ground, naval, and air training of the troops and their organizational structure and control system is being perfected. Modern military science is being developed and its tenets more widely applied in practice in the interests of strengthening combat readiness.

The results of the previous training year unquestionably show that the overwhelming majority of troop collectives rose to a qualitatively new stage in combat perfection. The number of masters of combat qualification, specialists 1st and 2nd class, honor students, and sportsmen and sportsmen with an official rating has grown among them. Socialist competition is widely expanding under the motto, "We execute the decisions of the 27th CPSU Congress and reliably defend the achievements of socialism." In training classes, on rifle ranges, firing ranges and tank training areas, and in tactical exercises, in flights and ocean sailings, Soviet soldiers persistently master complicated military equipment and methods of its use in combat, and by study, will overcome a powerful and technically well equipped enemy. Political enthusiasm and the business-like activeness of the Army and Navy personnel permit successes to be secured and developed, existing inadequacies to be eliminated, and new bounds in combat improvement to be taken.

The Soviet Armed Forces, born in revolutionary battles, baptized in the fire of combat for the freedom and independence of the Homeland, at 69 years, bears its combat banner with honor and virtue. Due to the unflagging care of the party and the selfless work of the Soviet people, our Army and Navy has, at its disposal, all that is necessary to successfully carry out the missions entrusted to them under modern conditions, in the 70th year of the Great October. And the Soviet people know: all, that has been created by the people is under the reliable protection of the USSR Armed Forces. The soldiers of the country of the Soviets are loyal to the cause of the Communist Pary, their homeland, and in unity with the soldiers of the Warsaw Pact country armies, are always ready to carry out their patriotic and international duty with honor. In being the glory of the October and the pride of their people, they vigilantly and reliably stand on guard of the peaceful, creative labor of our people, the great cause of peace and socialism.



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USA: STAKE IN MILITARY SUPREMECY

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 7-12

[Interview by editor of FOREIGN MILITARY REVIEW with Soviet General Staff Deputy Commander for Administration; "USA: Stake in Military Suremecy"]

The editor of the journal FOREIGN MILITARY REVIEW addressed a request to Maj Gen Yu. V. Lebedev that he answer a number of questions touching on the problems of security and disarmament and also current U.S. military policies. The text of the interview is given below.

QUESTION. From a military point of view how should we evaluate the Soviet-American meeting in Reykjavik?

ANSWER. Important issues of war and peace were discussed in Reykjavik. Therefore, this meeting, although it did not lead to formal agreements, will go down in history as an important stage in the struggle to solve the cardinal issues of disarmament.

The new measured Soviet approach uncovered the very essence of the problem and permitted non-important details of the fundamental issue to be cleared up: whether both sides (the USSR and the U.S.) are to ready make radical decisions? No one can doubt, that the Soviet Union is not only ready to undertake this, but persistently will intensify efforts in this direction in the future. Reykjavik unquestionably showed, that the main goal of Soviet policy, of the entire complex of Soviet American negotiations, is the elimination of nuclear weapons.

The package of important Soviet proposals, had it been accepted, actually would result, in a short period of time, in fundamental changes in all areas of the struggle to eliminate nuclear weapons and actually remove the threat of their use, and to begin movement toward a nuclear free world.

QUESTION. How do you, as a soldier, view the prospects of the Soviet proposals, in the realm of eliminating nuclear weapons, put forth in Reykjavik?

ANSWER. The Soviet proposals put forth at the Soviet-American meeting in Reykjavik by the General Secretary of the Central Committee of the CPSU, M. S. Gorbachev, were unprecedented in their scale and boldness. The Soviet Union put forth an aggregate of important proposals as compromises which gave practical results to the problems of nuclear and space weapons and concluded an agreement.

CONCERNING STRATEGIC OFFENSIVE WEAPONS. Having disposed of the question concerning American forward based nuclear systems, which have the range to reach the Soviet Union's territory, the USSR agreed to reduce only the strategic triad (ICBMs, SLBMs and heavy bombers) by not less than 50 per cent by the end of 1991 (each side would have 1,600 carriers and 6,000 warheads remaining), intending that, by the end of 1996, such weapons would be eliminated completely. A significant number of Soviet heavy ICBMs would be reduced.

With regard to MEDIUM RANGE MISSILES (MRBM), the U.S. and Soviet missiles in Europe would be completely destroyed, with the nuclear potential of Great Britain and France remaining. Here, the number of missiles with a range less than 1,000 km would be frozen. The Soviet Union would be able to have 100 MRBM warheads in Asia and the U.S. the same number on its national territory, deployed so that they would no be able to reach each others' territory

The American side agreed with these proposals in Reykjavik and minutes remained until an agreement was to be signed.

However, this did not occur because of the reluctance of the American side to take upon itself the reciprocal responsibility NOT TO WOTHDRAW FROM THE ABM TREATY (1972), OVER A TEN-YEAR PERIOD, WHILE STRICTLY OBSERVING IT and to refrain from testing weapons in space developed within the SDI program. The American side did not agree to the banning of nuclear tests.

Through the American administration's fault, an agreement in Reykjavik was broken off in favor of the "Star Wars" program and to please the U.S. military-industrial complex. But, what was achieved at the Soviet-American meeting was that the process of nuclear disarmament was taken to a new, higher level. A retreat backward will not happen.

The Soviet proposals remain on the negotiating table in Geneva. They have a "package" character because they reflect a balance of concessions and mutual interests, and because it is impossible to cut off the channels of the arms race on earth and leave openings in space. The Soviet delegation in Geneva is ready to discuss all the problems and, to the maximum extent, to work out an agreement on individual issues, but it is possible to put the agreements into effect only as a single unit.

We see, that the American side has selected a path in a different direction. After Reykjavik, it departed from that which was agreed upon in Iceland. In returning to its former typical positions, which were not permitted to be put forth earlier at the negotiations in Geneva, the U.S. is trying to obtain compromises only from the Soviet Union. It is understood, that this is not

the path to an agreement. The USSR has never and will never go for unilateral concessions.

The lessons of Reykjavik show: disarmament is possible, but all countries and peoples must fight for it.

The Soviet proposals are the expression of the policy of peaceful coexistence and are directed at strengthening a secure peace. Will they lead to success? This depends on many factors, including the actions of the U.S. But we believe in the possibility of positive shifts in the area of disarmament. Another possibilty is simply not given. Because, it is the path to nuclear catastrophe.

QUESTION. It is known that the U.S. also proposed a 50 per cent reduction in strategic offensive weapons. How does the Soviet proposal differ from the American?

ANSWER. The difference in the Soviet approach from the American approach, to a 50 per cent reduction in strategic offensive weapons, is as follows. The USSR proposes to reduce all strategic weapons by 50 per cent (ICMBs, SLBMs--submarine-launched ballistic missiles, and heavy bombers) and the warheads on them. At the same time, the composition of the remaining weapons after reduction, except the number of heavy ICBMs, will be determined at the discretion of each side. Such an approach will preserve the structure of strategic forces, which has come about historically, and will not bring harm to either side. The U.S. agreed with this approach in Reykjavik. However, now once again it is returning to its former position, insisting upon the sublevels of a specific weapon, including ICMBs. Washington's similar position is aimed at eliminating Soviet land-based missiles, the basis of the Soviet strategic forces, and at forcing the USSR to reorganize their structure.

QUESTION. In the announcements of Western representatives, one can hear an acknowledgement of the importance of the results in Reykjavik. Many of them speak of the readiness of the U.S. to achieve positive results in the negotiations in Geneva. How do these words match with this?

ANSWER. In reality, at present, in the West the mass information media more often provide an optimistic assessment of the results at Reykjavik. At the same time, having recovered from the first shock, caused by the Soviet Union's far-reaching measured proposals, directed at totally eliminating nuclear weapons, halting the arms race on earth, and banning its transfer into space, they started to "dismantle" the Reykjavik agreements in the West. This is even in regard to those issues, on which it was possible to achieve practical agreement, although no agreements were signed because of the U.S. position on SDI.

With regard to the congruence of words with actual deeds, the situation can be summed up thus. The Soviet Union, bringing a considered, well-thought out argumentative and realistic package of proposals, firmly put forth its position reflected in Reykjavik, and is ready at any time to take actual steps to implement the measures proposed in them. In the West, primarily in the

U.S., they are trying to tear apart, by fair means or foul, the Soviet package of proposals, and to extract from it what pleases them and essentially hide under a pile of fluffy words. As the Western newspapers now are writing, the American side, once again at the negotiations in Geneva, elicited meek diverse levels, sublevels, figures and plots, which M.S. Gorbachev calls the "naphthalene collection." By employing these intellectual acrobatics, they are again trying to drive the negotiations into a blind alley, having burdening them with such conditions and stipulations, which would take years years to agree upon, the spirit of understanding would be lost, and the arms race would capture its nitch in space. As one can see, the practical pursuits of Western policy do not simply differ from their words, but are completely contradicted by them.

QUESTION. According to Washington's opinion, in what is the offensive character of SDI reflected, and from a military point of view, how must the Soviet Union respond to the implementation of this program?

ANSWER. Space weapons, developed under the SDI program, are by nature offensive weapons. First, they can be used for the surprise destruction of important space systems belonging to the other side (early warning, communications and other satellites) for the purpose of "blinding," take by surprise and at the same time blow up or deprive it of the capability to respond to nuclear aggression. Secondly, space weapons (lasers, electromagnetic guns, and self-guided missiles) posses a great range, up to 4,000 to 5,000 km. They are capable of destroying various targets on earth from space. The question is of acquiring the capability to deliver a first strike and achieve decisive military superiority over the USSR and other countries.

In response to U.S. actions to undermine the balance by creating an antimissle defense and space weapons, the USSR could take an indentical step. It could improve strategic offensive weapons to such an extent that makes the American "Star Wars" program incredibly expensive and difficult to implement. The USSR will choose those methods of action, which will respond to the interests of its defensive capabilities to the greatest extent and make it necessary for the U.S. to search for a response to this. Our measures will not be those which Washington public figures like us to adopt. There will be an answer to SDI. But it will be asymetrical. In this case, we will not have to sacrifice much.

QUESTION. Could you elucidate what is specifically the reason for the necessity of SDI and the Soviet-American Treaty on the limitation to an ABM system.

ANSWER. In order to reveal the essence of this reason, let us turn to the Soviet-American treaty on the limitation of ABM systems and a little on the strategic weapons limitation (SALT) historical process.

The Soviet-American SALT talks began in 1969, and, from the very beginning, the antimissile defensive systems, being developed at that time, were a hinderence on their path. The continuation of this work, naturally, was necessary for the side not concerned about limiting strategic offensive

weapons, but about improving them, in order to insure a breakthrough of the enemy defense. As a result, the interdependence between offensive and defensive strategic weapons became apparent.

The sides acknowledged that only a limitation of ABM systems could open the road to an agreement reducing strategic offensive weapons. This problem was solved by the permanent Soviet-American Treaty on the limitation of ABM systems which took effect in October, 1972. Namely, therefore, in the preamble to this treaty, the sides wrote, "that effective measures to limit ABM systems would be the essential factor in controlling the strategic offensive weapons race."

The efficacy of this interrelationship remains in force to this day. However, in proposing to reduce, by 50 per cent, and, in the final analysis, over a period often years, destroy strategic offensive weapons, and eliminate American and Soviet medium-range missiles in Europe, the USSR could not help raising the issue concerning strengthening the ABM treaty conditions. Actually, the sides brought upon themselves the obligation of not withdrawing from the treaty for ten years, with strict observance of its provisions, and to carry out the research and testing in the realm of space ABM systems only in laboratories.

U.S. intentions, to develop a wide-scale ABM system within the framework of SDI, and to test its components under actual conditions, spoiled a possible agreement in Reykjavik. It became clear, that the U.S. administration is ready to break the ABM treaty in favor of SDI. The ABM treaty is the basis of the entire process in the limitation and reduction of strategic weapons. In my opinion, the fundamental danger of the SDI program is rooted in this.

SDI work and the position of the American side regarding the tests of space ABM weapons contradict the ABM treaty. It is sufficient to make the following comparisons to be convinced of this.

1. The ABM Treaty (Article 1) forbids the deployment of an ABM system on a country's territory and the development of the basis for such a defense. But as you know, the very thing at which the SDI was aimed was the protection of the entire U.S. territory.

2. The ABM Treaty (Article III) permits stationary ABM systems or their components to be deployed only on earth and within one region with a radius of not more than 150 km with the strict limitation of corresponding systems. The U.S. is planning to deploy weapons in outer space, not limited in number of ABM components.

3. The ABM Treaty (Article V) forbids building, testing, and deploying space-based ABM systems or their components. But as can be seen, such components are being assembled for development and testing in the SDI program.

I think that the presented facts are sufficient to understand why SDI and the ABM Treaty are not congruent.

QUESTION. In the West, concern is expressed that the Warsaw Pact clearly possesses superiority over NATO in conventional weapons. Would this not permit Western Europeans to rid themselves of nuclear weapons. Is this so?

ANSWER. This concern is groundless. If one does not take selective, but complex estimates, but rather the aggregate estimates, then a rough balance exists. I cite several facts.

NATO countries have a greater number of armed forces than the Warsaw Pact countries (5.6 million and 4.9 million men, respectively, judging by the brochure SOVIET MILITARY POWER). The population of the North Atlantic bloc countries is more than 1.5 times greater (620 million and 375 million people).

For example, take the number of combat ready divisions, which, without mobilization, could be used at the beginning of combat operations. In Europe there are: 84 combat ready divisions in NATO (considering France and Spain), and 78 divisions in the Warsaw Pact. The number of men in a deployed American division is 16,000 to 19,000 and in an FRG division there are 24,000 men, while at the same time the Warsaw Pact division has a maximum number of 11,000 to 12,000 men. Consequently, NATO has a significant advantage in combat ready divisions and their organized personnel.

Let us consider the issue of tanks. U.S. and NATO leaders, when this suits them, count only the tanks which are subordinated to NATO Allied Armed Forces commands in Europe. Nevertheless, they significantly underestimate the number of their tanks (there are 12,000 to 13,000 in all). In the same manner, there are more than 18,000 tanks assigned directly to the bloc's troops. Additionally, approximately 4,500 American and 6,500 tanks, belonging to Western European countries, are in storage. That is, NATO is not inferior to the Warsaw Pact in the total number of tanks.

If the ratio of conventional forces of the sides is objectively assessed, then the picture is such: NATO surpasses the Warsaw Pact in the total number of personnel and the number of combat ready divisions. It is approximately equal in the number of artillery and armored equipment. NATO is slightly inferior to the Warsaw Pact in the number of tactical aviation aircraft. As a whole, a rough balance exists.

The London Institute of Strategic Research came to this conclusion regarding this issue: "The balance between NATO and the Warsaw Pact organizations in conventional weapons is such, as before, as to make a military strike a highly risky undertaking, since neither side has the combined power at its disposal to be guaranteed victory."

QUESTION. It is known, that on June 11, 1986, the governments which participate in the Warsaw Pact addressed an appeal to the governments which are members of NATO, and to all European countries, in which the program to reduce the armed forces and conventional armament is supported.

Why do they call this a supplement to the program for nuclear disarmament?

ANSWER. As is known, on January 15, 1986, the Soviet Union proposed a program for the complete elimination of nuclear and other types of mass destruction weapons on earth by the year 2000. The program stipulates a phased (three stages) reduction of nuclear delivery systems and warheads.

45. On the basis of this program, comrade M.S. Gorbachev introduced far-reaching proposals for a compromise on the large scale 50 per cent reduction of USSR and US strategic offensive weapons by the end of 1991, having in mind their complete elimination over the course of 10 years, and the liberation of Europe from medium range missiles.

In connection with this, several U.S. European NATO allies began to say that, supposedly, without nuclear weapons, Western Europe will be under the threat of superior forces and the conventional weapons of the Warsaw Pact Organization. Such pronouncements have no ground.

First, as I have already said, a rough parity in conventional weapons exists between the Warsaw Pact Organization and NATO.

Second, on June 11, 1986, the conference of the Political Consultative Committee of the countries participating in the Warsaw Pact convened in Budapest, where an essentially new initiative of the socialist countries was proposed; a program for the reduction of the armed forces and conventional weapons in Europe, from the Atlantic to the Urals. In accordance with it, a one-time-only mutual reduction in the armed forces, by 100,000 to 150,000 men, is stipulated over a one to two year period and, in the beginning of the 1990s, up to 1 million men, and also conventional and operational-tactical nuclear weaponss.

Thus, although the program to eliminate the armed forces and conventional weapons in Europe bears an independent character, it is actually a supplement to the nuclear disarmament program.

QUESTION. In the Soviet program to eliminate nuclear and other types of weapons of mass destruction, mention is made even of banning chemical weapons. How is this issue currently being resolved?

ANSWER. The issue of banning chemical weapons is now being addressed at the Geneva disarmament conference. More than 400 governments are participating in the negotiations, including the USSR and the U.S. Although they have been going on for a long time, only in 1986, were actual prospects for their success noted. This became possible as a result of the important proposals formulated in M.S. Gorbachev's speech on January 15, 1986, and then solidified by the USSR delegation in Geneva on April 22 (to begin the destruction of chemical weapons reserves in the six months after the convention became effective; after 30 days announce the places where they are produced, and then after a year, to begin their elimination; rapidly stop all activity at chemical weapons production sites and support their non-production mode until the elimination of these sites is finished. International control must be provided for this, right up to on-site inspections of all the important operations to destroy the military-chemical potential of the sides, including measures, precluding the possibility of using commercial enterprises, private

firms and transnational corporations for the development and production of chemical weapons.

On the other hand, we are witnesses to the negative processes in the matter of nuclear disarmament. Appropriations have been made in the U.S. for the production of a new, more dangerous variety of chemcial weapon, the binary weapon. It should be noted immediately, that the development of binary weapons and the plans to build up the U.S. chemical arsenals at its basis stands to threaten the very possibility of achieving an effective ban of chemical weapons. The binary conception, being a product of the American plan to achieve military superiority, stipulates the opening of yet another channel in the arms race imposed by the United States, a chemical channel. It stimulates the spread of chemical weapons horizontlly and makes them achievable for many countries, since the production of chemical weapon components can be carried out in the conditions of conventional chemical enterprises and concealed in the midst of transnational corporations.

Nevertheless, the USSR believes that we can be completely rid of all chemical weapons in this century. Mainly, such principles of a multilateral agreement were proposed at the negotiations, which would reliably preclude the capability of retaining or the secret rebirth of the military chemical potential of this or any nation. From our point of view, if the U.S. and its NATO allies abandon the positions, pursuing the goal to obtain unilateral advantages in the issue of banning chemical weapons, the negotiations in Geneva could be sped up so that next year it would be possible to conclude the development of a corresponding convention.

QUESTION. How may the actual step of the U.S. administration to break off the Soviet American SALT-2 treaty be evaluated?

ANSWER. The introduction into service of the 131st heavy bomber, equipped for cruise missiles, led to the violation on the American side of the limit (1,320 aircraft) of strategic carriers with targetable warheads or with long-range cruise missiles (more than 600 km). This graphically confirmed Washington's striving for military superiority and showed that the U.S. administration will not settle for peace under conditions of parity. Namely, such conditions were regulated and fixed by the SALT-2 Treaty. In breaking this treaty, the entire essence of the foreign policy of the American leadership circle is revealed as the reason for the escalation of the arms race. The strategic parity goes against the liking of the United States leadership. It does not want to aknowledge that it is possible to talk with the USSR only on equal terms. Washington does not even want to grant the Soviet Union the same right to equal security. From here, it attempts to recover the military advantage. But today, such an undertaking is hopeless. As the Soviet government`s pronouncement emphasized, Washington is making a big mistake. The withdrawal from the limits established by the SALT-2 Treaty will not strengthen U.S. security.

QUESTION. What kind of investment in the Security of Europe and in the strengthening of trust between countries has the results of the Stockholm Conference brought?

ANSWER. The results of the Stockholm conference are very important for the strengthening of trust and in meeting the expectations of the people of Western Europe and the entire world. For the first time in many years, the countries of the East and West were able to achieve important agreements on the essential problems of security and trust, including the military realm. This became possible, because common sense, political realism and a feeling of responsibility prevailed.

In Stockholm, the closing Helsinki statement obtained practical development in new important attitudes in accordance with political and military realities currently existing in Europe. A qualitatively new stage on the path to the development of an atmosphere of great trust and the strengthening of security was achieved, responding to the vital interests of all European nations and peoples. A great openness and prognosis in the relations between military organizations of the West and East was provided, which is very important in overcoming the stratification of suspiciousness, reducing the risk of an armed conflict and the use of force, reducing the preoccupation and anxiety connected with the build-up of armed forces on the continent.

What occupies a comparatively small place in the closing statement and in the document of the Stockholm Conference, has grown into an impressive, detailed developed code of rights and regulations. Now the material basis of the military aspects of security is brought under the political aspects of European security.

On the whole, in summing up the result of our discussion, I want to emphasize, that the results of the meetings in Reykjavik and the Stockholm Conference have shown: agreements leading to nuclear disarmament and the strengthening of the measures of trust, including in the military realm, are possible. The struggle to create a nuclear free world now has entered into a new, higher position from which it will be necessary to activate a peaceful offensive in all directions.

Along with these, the negotiations in Reykjavik became, in their own way, a touchstone for the policies of two of the largest powers. When the USSR came forward with bold and radical plans for a sharp balanced reduction in the nuclear potential, and then their elimination in a short time, the U.S. demonstrated its own inability to budge generally from a position in these cardinal issues of world politics. The Soviet-American meeting, confirmed that Washington's striving for military supperiority and the implementation of the sinister design of the "Star Wars' program is the main obstacle on the path to radical disarmament.



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ISRAELI ARMY--INSTRUMENT OF GENOCIDE AND PIRACY

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 13-18

[Article by Lt Col A. Yakovlev; "The Israeli Army--Instrument of Genocide and Piracy"]

[Text] The political-military situation in the Middle East from the moment of the founding of the state of Israel has been characterized by tension and instability. The main reason for this is the expansionistic and misanthropic policies of Israel, its attempts to reinforce its dominance in the region and to force the Arabs to recognize the Zionist state in so-called "security zones."

As is well known, the decision by the General Assembly of the UN on the creation of two states in Palestine--arab and jew--and the international zone of Jerusalem was made in November, 1947. From the moment of its formation in May of 1948, Israel, using the support and patronage of the U.S. and other NATO countries, has acted as a brazen aggressor and a source of war and military danger.

During the first Arab-Israeli war (1948-1949), Israeli aggressors occupied West Jerusalem, part of the territory of the Arab state, having expelled from this territory more than 340,000 Arabs. In October 1956, Israel with Great Britain and France, began a triple aggression against Egypt. Only the active intervention of the Soviet Union put an end to it. However, this did not quiet Zionism. With the help of the U.S. and a number of other NATO countries (Britain, France and the FRG), from which there was an uninterrupted flow of weapons and military equipment, Israel developed massive armed forces and in June 1967, unleashed a new war against the Arab states--Egypt, Syria, and Jordan. During the six-day blitzkrieg, Israeli plunderers occupied the Sinai Peninsula, the West Bank of the Jordan River, the Golan Heights, and the eastern part of Jerusalem. Hundreds of thousands of Arabs joined the ranks of refugees, having been chased from their age-old lands.

Zionist expansionism achieved new development in the third major war against Egypt and Syria, unleashed in 1973. In this usual Israeli aggression, which cost it 8 billion dollars, half of Israel's tanks and a third of its aircraft were destroyed. However, even on this occasion international Zionism sent Tel

Aviv liberal economic and military assistance, on the basis of which the aggressor prepared new actions against its neighboring Arab states. In March of 1978, the Israeli army occupied southern Lebanon, having created there a reactionary rightwing Christian formation, the consequences of which led to new conflicts.

"Strategic Cooperation" between the U.S. and Israel led to legitimazation of the trilateral collusion between the U.S., Israel and Egypt at Camp David in September 1978, and sowed the seeds of new wars, armed strife, provocation, and conflicts. In the summer of 1982, Israeli militarists again unleashed combat action against Lebanon, accompanied by death and destruction. The longest and bloodiest war by Israelis against the Palestinian and Lebanese people began. The Zionist clique pursued their longstanding goals: destroy the Palenstinian opposition movement, remove the independence of Lebanon and turn it into a satellite of the United States and Israel, oust the Syrian forces which were there as part of an all-Arab force from Lebanese territory, and create a launching pad for an attack on Syria.

Only the hard and consistent position of the Soviet Union and the other socialist countries, forces of progress in the Arab world, and the constant blows inflicted by the Palestinians and Lebanese patriots forced Tel Aviv, in June of 1985, to withdraw its forces from Lebanon. However, even now it continues to stir up inter-Lebanese conflicts, and renders every type of help to the pro-Israel conservative Christian forces. Having formally transferred a strip of Lebanese territory 15 km wide along the Israel-Lebanon border to the puppet "Army of Southern Lebanon," Israel actually occupies this land and is making plans to grab off still more territory.

Under the banner of combatting "international terrorism" (they also carry out this practice), Tel Aviv conservatives have not ended their threats to Syria, Lebanon, and the other sovreign Arab states, as underlined by their bloody activities. On October 1, 1985, Israeli air struck the outskirts of Tunis under the guise of destroying Arab "terrorists."

As international observors have noted, Tel Aviv's aggressiveness in the very near term will not decrease since the causes continue--the Zionist concept of creating the "great Israel from the Nile to the Euphrates," the unlimited military and economic power of the United States and Zionism, and the attempt to create a permanent homeland in Israel for the maximum number of jews and to settle occupied Arab territory with them.

Splitting the Arab states along religious and ethnic lines remains one of Tel Aviv's most important tactics. Accomplishment of this in conjunction with grabbing parts of neighboring countries permits, according to Israeli theoriticians' calculations, a system of "religious-ethnic corridors" to be created in the Arab world and prevents the possibility of conducting united military activity against Israel. Achieving this will be accomplished, according to the plan, by breaking up the contiguous countries of Lebanon, Syria and Jordan. Lebanon would be divided into two to five provinces, The initial stage would be creation of the so-called "security zone" in the south of this country, controlled by the puppet "Army of Southern Lebanon," but actually by Israeli armed forces. Avoiding direct military confrontation,

Israel works up plans to inflict under the proper conditions a military attack on Syria and its division into Suni, Alavite and Druzh states. With respect to Jordan, the plan is to destabilize the situation and to capture it in pieces. Ever more often the Israeli leaders are talking about the necessity to establish control over the oil producing regions of Saudi Arabia and the other states on the Persian Gulf.

An important place in the policies of Israeli leadership is occupied by development of military cooperation with the western states, especially the United States, who have actually received the right to unlimited use of the territory of Israel, its air and naval bases, and other militarily useful places. An agreement has been reached on placing in storage, on the "promised land," of American supplies of weapons and military equipment, for use in crisis situations by the Rapid Deployment Force and the Israeli Army.

In the field of military-technical cooperation, the U.S. provides Israel with the most modern technology for creating a number of modern forms of weapons and military equipment (the LAVI combat aircraft, the MERKAVA tank, and missile boats), aids in modernization of the avaition, ship building, and tank making branches of its industry. Look at the use by Israel of the American satellites, especially for military purposes, and the aid given by the United States in developing their own satellite communications. In accordance with agreements concluded between the two countries, Israeli research centers and firms take an active part in dozens of projects under "Star Wars."

International society has special concern over the fact that United States leadership does not prevent participation by a number of American firms in the development of the Israeli nuclear industry. According to data published late in 1984, by the Carnegie Fund (U.S.), Israel at that time had 20 atom bombs. It is believed that by the year 2000 that number could triple. The English SUNDAY TIMES also reported that, according to a former worker in the Israeli nuclear center in Dimon (in the Negev desert) and other nuclear experts, Israel already has up to 200 nuclear munitions.

From year to year, the amount of American military aid to Israel increases. Since the formation of Israel, from the U.S. alone it has received more than 3,000 tanks, 1,000 field artillery pieces, 4,000 APCs, 700 military aircraft, and 200 helicopters. In the immediate future, according to the foreign press, the Israeli Army should receive more than 500 tanks, 200 field artillery pieces, 600 APCs, about 100 combat aircraft, 10 missile boats, and many other types of weapons and military equipment.

THE ISRAELI ARMED FORCES are the principal means of accomplishing the aggressive policies of the Zionist circles in the country. They consist of regular forces (Army, Air Force, and Navy) and territorial defense forces which add the militarized youth organization "Gadna," civil defense "Chaga," and police border patrol.

The highest military-political organization in the country is the military council (defense council). Its membership includes the prime minister (chairman), and ministers (defense, economy, finance, internal affairs,

transportation, and communications). Other major representatives of ministries and departments may be invited to meetings of this council.

The council determines foreign military policy of the state; the principal problems in preparing the country for war; the direction of the development of the armed forces, their size and structure; makes decisions on the conduct of individual combat operations or on starting a war against Arab countries; and coordinates activities of the ministries and institutions in military matters.

Leadership of the armed forces is exercised by the commander in chief (prime minister) through the ministry of defense and the general staff. An active member of the ruling party, usually a retired general, is appointed as minister of defense.

The Ministry of Defense is reponsible for manning the armed forces, training the reserve components, material-technical support, production and acquisition of armaments, the activities of those research and development institutions working in support of the army. Also subordinate to the Ministry are organizations conducting the ideological preparation of personnel.

The general staff exercises operational control of the armed forces. The chief of the general staff is appointed by the minister of defense for a term of three years and is confirmed by the military council. He directly commands the armed forces, determines the direction of their development, is responsible for preparing and conducting operations, as well as mobilization and calling up of the forces. The general staff has the following departments: operations, combat training, intelligence, personnel, and logistics.

In a military-administrative sense, the country is divided into three regions: Northern, Central, and Southern. The number of units assigned to them is not fixed and depends on the missions of the region.

According to the Jaffe Strategic Research Center (Israel), the overall strength of the armed forces is 172,000 of which the Army is 135,000, the Air Force is 28,000 and the Navy is 9,000. Also, there are 10,000 territorial defense forces. There are 554,000 personnel in the Israeli Army reserves, of which 494,000 are ground forces, 50,000 air, and 10,000 naval. Thus, in foreign specialists' opinion, when expanding, the strength of the Israeli armed forces can reach 540,000 (440,000 ground, 80,000 air, and 20,000 naval).

The ground forces are the main and the largest service of the armed forces. They are considered by the Israeli command as the principal element for combatting the Arab armies and for securing captured territory. They contain all of the basic branches of forces and service: infantry, artillery, armor, airborne, engineers, and signal. Each branch has a commander who is directly subordinate to the chief of the general staff.

The principal tactical formation in the ground forces is the armored division. It includes one or two tank and one or two mechanized infantry brigades, an artillery regiment, battalions (reconnaissance, combat engineer, signal), and division support. In its armament are up to 300 tanks, about 150 field

artillery pieces and mortars of various calibers, ATGM launchers, portable SAMs, other air defense weapons, APCs and armored cars.

Divisions and brigades are staffed and equipped at 100 per cent. First line reserve units are filled 45-50 per cent with personnel and 90-100 per cent with equipment, second order reserve units respectively 10-15 per cent and 80-100 per cent. In foreign specialists' opinion, the time required to field a first line reserve unit is up to 36 hours, and about 72 hours for a second line unit.

At the present time, there are 11 armored divisions and up to 20 separate brigades, including 7 airborne, in the army. Their inventory includes 12 LANCE missile launchers, more than 3,00 tanks (M60A1 and A3, M48A5, MERKAVA, CENTURION), more than 1,200 field artillery pieces, nearly 100 multiple rocket launchers with calibers of 160, 240, and 290mm, and more than 1,000 mortars. Units are equipped with large numbers of anti-tank weapons, mainly TOWs, DRAGONs and COBRAs. For air defense coverage they use CHAPARRAL and anti-aircraft guns such as VULCAN, and the portable REDEYE missile.

A lot of attention is given to increasing the mobility of ground force units. In their equipment are about 8,000 armored carriers and cars, of which 4,000 are the American M113.

The Air Force is an independent service which receives the highest level of attention from the Israeli command. It is designated to conduct, first of all, offensive air operations, gain air superiority, direct support of the ground forces and the Navy, aerial reconnaissance, and air delivery of forces and cargo. The Air Force is considered by Israeli political-military leadership as the main strike force in conducting lightning wars and punitive operations of any scale.

This service has the following types of aircraft: fighter-bomber, interceptor, reconnaissance and support. The highest organizational entity in the Air Force is the airbase, which trains personnel and develops missions for units of all types of aviation. It consists of a headquarters, one or two wings with mixed compositions, air defense artillery, and material support.

The Air Force inventory includes more than 600 combat aircraft of which there are: 50 F-15, 75 F-16A and B, about 150 F-4 PHANTOMs, up to 200 KFIR, 130 A-4N and J SKYHAWKS, etc.

Special and support aircraft number about 200, in particular: 4 radar and control HAWKEYEs, 11 Boeing 707, 18 C-47s,22 C-130 HERCULES, and others.

In the Air Force there are also more than 200 helicopters, including: 30 AH-1G and S (fire support), about 30 500MD DEFENDERS, and about 20 CH-53 transports.

Air munitions include MAVERICK air-to-ground missiles, and guided missiles of the R.530-Class MATRA, SIDEWINDER, SPARROW, and SHAFRIR (Israeli produced) in the air-to-air class.

Main airbases are: Haifa, Hatserim, Hatsor, Lod, Ramat-David, Tel Aviv, Uvda, and Palmachim.

The Navy is a branch of the armed forces which should accomplish the following missions: conduct independently and jointly with the Air Force combat operations against enemy navies; secure communications and the eastern part of the Mediterranean Sea and ensure the defense of the beaches of naval bases and ports; conduct missile attacks on shore targets; during operations, land amphibious forces and diversionary forces on enemy shores; support the ground forces operating near the shore; and conduct reconnaissance in the eastern Mediterranean.

The Navy organization consists of the commander and staff, formations and units of combatants and boats, naval bases, shore organizations and training institutions. They are divided into two groups: Mediterranean (more than 90 per cent of the ships), and Red Sea. Ships are based at Haifa (main base) Ashdod and Eilat.

The Navy inventory includes more than 80 combatants of which there are: 3 project 206 submarines, 12 SAAR-2 and 3 missile boats; 9 RESHEF (SAAR-4), 2 ALIYA, 2 DVORA, 32 supply ships DABUR, 9 PBRs, and 4 KEDMAs.

Frigate weapons include GABRIEL 1, 2 and 3 missiles, HARPOON, BARAK, and 20-mm VULCAN-PHALANX.

The third hydrofoil-type missile boat of the FLAGSTAFF-2 Class is expected to become operational in the near future. Ten boats of this class are to be produced at national shipyards to replace SAARs and RESHEFs. Here also construction of small missile boats is being completed.

Territorial defense forces (NAHAL), created in 1949, are an active part of the armed forces. Terms of service for officers, non-commissioned officers, and soldiers, both regular and reservists of all categories, is the same as for the Army. NAHAL forces actively participate in creating systems of military communes on the borders and occupied territory which is considered by Israel to be the first line of ground defense in case of a surprise attack, and in peacetime as a base for training the population without significant interruption of the economy.

Military communes are strong points with 30-40 people under the command of an officer. They have stocks of arms, ammunition and rations. After a commune is completed and agriculture begun, NAHAL units convert it to a civilian commune and are moved to another location to open a new one. These forces amount to up to 12 brigades which are subordinate to the Army.

The territorial defense organization and employment for military and civilian purposes is being studued by the armies of a number of countries, more than 20 of which have agreements to receive assistance from Israel in creating their own similar forces.

HAGA civil defense was created in 1948. Overall command of this organization is carried out by the Chief of the general staff, and the

commander of national civil defense is appointed by him to direct command. The territory of Israel is divided into several regions which, in turn, include districts and divisions covering, in cities--several streets, and in rural areas--usually seven settlements. Within districts there are regional detachments--companies and platoons. Men 45 years and older are called for service in Haga. Unmarried and childless women are also obligated to serve in this organization up to the age of 34.

All civil defense matters are closely coordinated with the armed forces. Any element of the armed forces not engaged in a military mission may be used for a civil defense mission or for conflict with natural calamities.

The militarized youth organization GADNA (formed in 1948) serves for ideological training of youths in Zionism, antiarabism, and an anticommunist spirit, for military training of youth for service in the Army, and for other work in support of the Army and the state. Its membership comprises a significant fraction of the young men and women between the ages of 14 and 17. The organization is headed by a commander with the rank of colonel who is directly subordinate to the chief of the general staff. The basic formations of Gadna are battalions, consisting of several detachments.

The training program for members of these organizations is designed to last two years and is divided into two stages. During the first stage, this training proceeds without interrupting normal school (work) activities for 4 hours a week in clubs and in the organization's training centers. In public schools, military training is included in the school program (four hours a week and one full day a week). The program for the second stage is supposed to be conducted during the summer vacation in training camps and armed services centers.

Some of the young people in Gadna are used to repair defense equipment and for ordnance disposal, and to maintain weapons and equipment in storage. There is also a network of farms and labor colonies where members work and undergo military training during summer vacation. Altogether, some tens of thousands of young people attend various types of military training during the summer period.

The womens' corps, H'EL NASHIM, numbering more than ten thousand, has as its head a woman with the rank of colonel. There are women's organizations in nearly every unit of the Army, Navy and Air Force. Personnel for these are trained in a special training center (basic training for recruits), NCO and officer schools, as well as a number of training bases under the leadership of woman officers. Women serve principally as radio-telephone operators, nurses, staff technicians, parachute packers, and military police.

Terms of service. Manning the armed forces is accomplished on the basis of the law on universal military service enacted on 1 October 1949, and later amended and enlarged. However, in actuality, they call mainly jews and, of the national minorities, only Druze arabs are drafted for service in the border patrol. Men 18-54 years old and women 18-38 are under military obligation.

The following terms of active service have been established: for men 18-26 years old, 36 months; from 27-29 years old who haven't been drafted earlier for some reason, 30 months; for immigrants who arrive in Israel between the ages of 27 and 29, 20 months. Women of all ages serve 24 months.

During the period of service in the reserves, soldiers, NCOs and officers are regularly called up for retraining. Reserves in the first category (men 18-39, women 18-34) must participate in one day per month and annual month-long active duty. However, as rule, these do not occur monthly but rather as a three-day drill every three months. They are placed in those organizations to which reservists are assigned. Second category reservists (men 45-54) undergo individual training during a three-day drill once every three months, and unit training during an annual two-week drill. For reserve officers and NCOs of both categories, the retraining period is lengthened to one month.

In Western military specialists' opinion, the Israeli Army is noted by its quite high level of professional preparedness and training of cadres. On the whole, offices meet current requirements and serve as the main conduit of political and ideological correctness in the country. A large part of the generals and senior officers reflect a reactionary attitude which has been influenced by their participation in the Arab-Israeli wars. The morale of the soldiers and NCOs together with the level of dedication to the Zionist state also are determined by such characteristics as striving for money-grubbing gain, and the cold-blooded killing of Arabs. Many of them relate to military service as a positive factor in their lives. All of these qualities have often been manifest in wars, reprisal operations, and various warlike actions against neighboring Arab states.

However, in recent times, as foreign specialists believe, under the influence of the Israeli adventure in Lebanon and a general exacerbation of the internal situation in Israel, a decline in the prestige of military service has been observed. Especially troubling to the Israeli command is the existence among the soldiers and reservists of a pacifistic and critical attitude. An example of this is the massive participation by soldiers and officers in a demonstration by Israelis against the war in Lebanon. Several hundred servicemen signed a petition to the Ministry of Defense refusing to serve in the Army, and some preferred imprisonment to service in Lebanon.

Under these circumstances, the Israeli armed forces pay great attention to preparing the Army and reserve components for new aggressive acts against the population of the Middle East, constantly rattle their sabers, and contribute to the atmosphere of military psychosis. Everywhere in this Middle Eastern gendarme is the influence and support of the United States, which gives it massive aid and approves its territorial acquisitiveness. The Soviet Union and the other countries of the socialist community have always stood and still

stand on the side of the Arab people in their just fight for elimination of the consequences of Israeli aggression.



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STRENGTH OF FOREIGN STATES' ARMED FORCES

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[Article by Col G. Petrukhin; "Strength of Foreign States' Armed Forces"]

[Text] The size of the population and the personnel strength of the regular armed forces of the states, cited below as of the end of 1986, is according to data in the foreign press (1,000s of persons):

| COUNTRIES | POPULATION | REGULAR ARMED FORCES | | | |
|---|---|---|---|---|---|
| | | TOTAL | ARMY | AIR FORCE | NAVY |
| 1 | 2 | 3 | 4 | 5 | 6 |
| | | NORTH AMERICA | | | |
| Canada | 25 450 | 83 | 30.2 | 38.3 | 14.5 |
| U.S.A. | 240 000 | 2156.6 | 780.6 | 606 | 770 |
| | | WESTERN EUROPE | | | |
| Austria | 7560 | 54.7 | 50 | 4.7 | — |
| Belgium | 9900 | 92 | 68 | 19.5 | 4.5 |
| Great Britain | 56 100 | 325.5 | 161.5 | 93.5 | 70.5 |
| Greece | 10 300 | 193.5 | 150 | 24 | 19.5 |
| Denmark | 5140 | 30.7 | 18 | 7 | 5.7 |
| Ireland | 3600 | 13.8 | 12 | 0.9 | 0.9 |
| Spain | 39 700 | 315.5 | 230 | 33 | 52.5 |
| Italy | 57 200 | 385 | 270 | 70.5 | 44.5 |
| Luxembourg | 367 | 0.7 | 0.7 | — | — |
| The Netherlands | 14 500 | 102 | 67 | 18 | 17 |
| Norway | 4160 | 41 | 24 | 9.4 | 7.6 |
| Portugal | 10 300 | 67.8 | 40 | 13.8 | 14 |
| FRG | 59 300 | 495 | 341 | 109 | 38.5 |
| France | 55 500 | 477 | 300 | 97 | 68 |
| Switzerland | 6513 | 20 | 16 | 4 | — |
| Sweden | 8400 | 64.6 | 47 | 8 | 9.6 |

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| | | | AFRICA | | |
| Benin | 4000 | 3.5 | 3.2 | 0.2 | 0.1 |
| Burkina Fasso | 7000 | 4 | 3,9 | 0.1 | — |
| Burundi | 4900 | 7.2 | 5.3 | 0,2 | 0.1 |
| Gabon | 1010 | 2,7 | 1.9 | 0.6 | 0,2 |
| Ghana | 13 200 | 11.2 | 9 | 1 | 1.2 |
| Djibouti | 400 | 3 | 2.87 | 0.1 | 0.03 |
| Egypt | 49 500 | 445 | 320 | 105 | 20 |
| Zaire | 31 600 | 50 | 22 | 2.5 | 1 |
| Zambia | 6900 | 16.2 | 15 | 1.2 | — |
| Cameroon | 9800 | 7,3 | 6.6 | 0.35 | 0.35 |
| Kenya | 19 900 | 13.6 | 13 | — | 0.6 |
| Liberia | 2404 | 6.7 | 6.3 | — | 0.4 |
| Mauritania | 1900 | 8.5 | 8 | 0.2 | 0.3 |
| Madagascar | 10 200 | 21.1 | 20 | 0.5 | 0.6 |
| Mali | 8100 | 5 | 4.6 | 0.4 | 0.05 |
| Morocco | 23 000 | 205 | 150 | 13 | 7 |
| Niger | 6300 | 2.2 | 2.1 | 0.1 | — |
| Nigeria | 07 200 | 94 | 80 | 9 | 5 |
| Republic of Cote-Divuar | 9800 | 13.2 | 6.1 | 0.9 | 0.7 |
| Rwanda | 5560 | 5.2 | 5 | 0.2 | — |
| Somalia | 6430 | 62,7 | 60 | 2 | 0.7 |
| Sudan | 23 500 | 58.6 | 53 | 3 | 0.6 |
| Togo | 2900 | 5.1 | 4.7 | 0.3 | 0.1 |
| Tunis | 7300 | 40 | 30 | 3.5 | 3.5 |
| Uganda | 15 200 | 6,1 | 6 | 0.1 | — |
| Central African Republic | 2600 | 2.3 | 2 | 0,3 | — |
| South Africa | 29 500 | 106.4 | 76,4 | 13 | 9 |

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| | | ASIA and AUSTRALIA | | | |
| Bangladesh | 104 000 | 92 | 82 | 3 | 7 |
| Bahrain | 420 | 2.8 | 2,3 | 0,2 | 0.3 |
| Burma | 40 500 | 186 | 170 | 9 | 7 |
| Brunei | 247 | 4,1 | 3,4 | 0.2 | 0.5 |
| Israel | 4400 | 172 | 135 | 28 | 9 |
| India | 778 000 | 1260 | 1100 | 113 | 47 |
| Indonesia | 164 000 | 281 | 216 | 27 | 38 |
| Jordan | 2700 | 70,5 | 63 | 7,2 | 0,3 |
| Qatar | 300 | 6 | 5 | 0,3 | 0,7 |
| South Korea | 43 000 | 601 | 520 | 33 | 48 |
| Kuwait | 1700 | 13,1 | 10 | 2 | 1,1 |
| Lebanon | 2700 | 17,4 | 16 | 1,1 | 0,3 |
| Malaysia | 16 600 | 110 | 90 | 11 | 9 |
| Nepal | 16 900 | 30 | 30 | — | — |
| United Arab Emerites | 1300 | 43 | 40 | 1,5 | 1,5 |
| Oman | 1600 | 21,5 | 16,5 | 3 | 2 |
| Pakistan | 98 000 | 480,6 | 450 | 17,6 | 13 |
| Saudi Arabia | 8500 | 67,5 | 40 | 14 | 3,5 |
| Singapore | 2600 | 56 | 45 | 6 | 5 |
| Thailand | 52 800 | 256 | 166 | 48 | 42 |
| Taiwan | 20 200 | 424 | 270 | 77 | 77 |
| Turkey | 51 400 | 624 | 520 | 55 | 49 |
| Philippines | 56 400 | 113 | 70 | 17 | 26 |
| Sri Lanka | 16 500 | 37,6 | 30 | 3,6 | 4 |
| Japan | 123 000 | 262 | 180 | 43 | 39 |
| Australia | 15 800 | 71 | 32 | 23 | 16 |
| New Zealand | 3300 | 12,4 | 5,5 | 4,3 | 2,6 |

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| | | | LATIN AMERICA | | |
| Argentina | 31 300 | 108 | 55 | 17 | 36 |
| Bolivia | 6500 | 28 | 20 | 4 | 4 |
| Brazil | 139 000 | 284 | 183 | 51 | 50 |
| Venezuela | 16 900 | 71 | 34 | 5 | 10 |
| Haiti | 5500 | 6.9 | 6.4 | 0.2 | 0.3 |
| Guyana | 900 | 5,5 | 5 | 0,2 | 0.3 |
| Guatemala | 8600 | 31.7 | 30 | 0.7 | 1 |
| Honduras | 4500 | 19.2 | 17 | 1.5 | 0.7 |
| Dominican Republic | 6300 | 22 | 13 | 4 | 5 |
| Colombia | 20 500 | 66.2 | 53 | 4.2 | 9 |
| Mexico | 81 100 | 129 | 100 | 5.5 | 23.5 |
| Panama | 2100 | 12 | 11.5 | 0.2 | 0.3 |
| Paraguay | 3400 | 16 | 12.5 | 1 | 2.5 |
| Peru | 20 000 | 127 | 85 | 15 | 27 |
| Salvador | 5600 | 43 | 39 | 2.7 | 1.3 |
| Uruguay | 3000 | 32 | 22 | 3 | 7 |
| Chile | 12 300 | 101 | 57 | 15 | 29 |
| Ecuador | 10 400 | 42 | 35 | 3 | 4 |

NOTES:

1. Western specialists do not include the organized reserves of the U.S. armed forces and the National Guard in the strength of the regular armed forces. However, in reality, they execute the very same missions (they number 1.1 million personnel).

2. In several countries, personnel of the strategic nuclear forces, the central military establishment and special units, and also the molitary gendarmery, which is not shown by armed forces branch, are included in the total strength of the armed forces.

3. In the division "Western Europe" (FRG), data on the ground forces are cited in column 4.



9355
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BUNDESWEHR ARMORED DIVISION ON THE DEFENSE

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 21-27

[Article by Col A. Egorov; "Bundeswehr Armored Division on the Defense"]

[Text] Reactionary circles in the FRG, fully supporting the U.S. in its aggressive intentions, and opposing positive processes, living in peace, thanks to the policies of the Soviet Union, is following a course of further militarization of the country and is taking measures to equip its armed forces with highly effective weapons and equipment, and is paying considerable attention to training the forces for war.

Improving the forms and methods of conducting mainly offensive warfare, the Bundeswehr commanders also place emphasis on finding the most effective means of conducting the defense, which is considered a temporary activity which is usually conducted to stop the enemy offensive and to create favorable conditions for transitioning to their own offensive.

ORGANIZATION OF DEFENSE. As the Army commanders suggest, division-level defense on the modern battlefield should be active, firm, echeloned in depth, preparead for armor, vertical envelopment, nuclear weapons, and massive air and artillery strikes. Active defense is achieved by timely and extensive maneuvers along the front and in depth, taking effective measures to destroy the enemy throughout the depth of the defense, and by continuous fire on the advancing enemy. Its firmness is achieved mainly through proper combat formations for the situation, skillful use of terrain, use of coordinated barriers, anti-tank fire, and the obstinacy of the forces conducting defense.

The basic principle for modern warfare, which is subscribed to by FRG military specialists, is skillful coordination of maneuver by divisions and brigades with all types of fires, especially nuclear and high-accuracy fires.

The tank division, judging by reports in the foreign press, will conduct defense, as a rule, as a part of a corps in its first echelon (in the case of a broad front defense, or in the second, being the main strike ) force of the corps. It may be used against the main armored approach attack or a supporting attack, and, in certain circumstances, especially early in the war, may also conduct an independent defense.

West German manuals state that the division may transition to the defense during the course of battle or in advance, when in direct contact with the enemy or not.

As the foreign military press reports, depending on the situation, the tank division will conduct one of two types of defense: mobile and position. Transition from one to the other is determined principally by the mission, terrain, and the enemy operation and formation.

The division may transition TO MOBILE DEFENSE after an unsuccessful meeting engagement, and also upon repelling an offensive and counterattacking a major enemy force when the terrain permits defense on a broad front, and to make maneuvers necessary by brigades and battalions during the defense. Its goal is to stop the enemy advance, inflict significant losses on him and create favorable conditions for transitioning to the attack or making a corps counterattack.

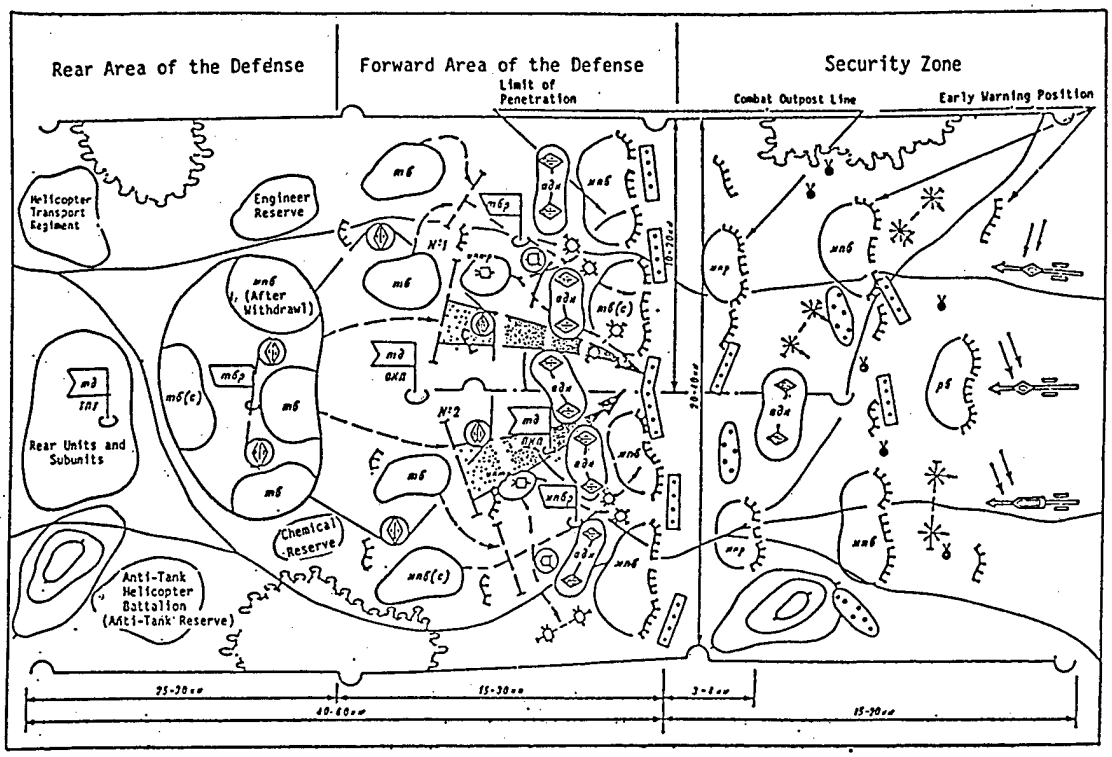
The basis of mobile defense is maneuver of forces and fires. It is not characteristic to organize a solid defensive position. Therefore, less of the armored division's assets are placed in the first echelon in order to disrupt the attacker, wear him down and compel him to advance into a favorable area (so called killing zone) where he is destroyed by air strikes, fires and a strong counterattack. Most of the division's forces are placed in the second echelon to destroy the trapped enemy attacker and transition to the offensive. It is believed that the success of the mobile defense in defeating an enemy force is made possible by allowing the enemy force to penetrate to a predetermined depth. (Fig. 1) According to West German manuals, an armored division mobile defense will normally be used under conditions where either nuclear weapons or highly accurate conventional munitions are being employed.

A division may use A POSITION DEFENSE when it is necessary to hold occupied terrain (a specified locality, region or objective), when defense in depth is not possible, when terrain does not permit maneuver against advancing enemy forces, and when time does not permit development (in an engineering sense) of a defensive position. This type of defense will normally be used in conjunction with conventional munitions.

Under contemporary conditions, a positional defense is based on the following factors: maximum use of fires, especially highly accurate ones; effective means of destroying armor, use of reconnaissance and target designation, and carefully coordinated engineer preparation of the local terrain, placement of the division main forces in the first echelon for inflicting maximum losses on the attacking enemy forward of the FLOT. Abandonment of positions by their units is not envisioned either in manuals or in the course of daily training exercises (Fig. 2).

As evident from reports in the foreign military press, in all types of defense the main attention is placed on careful preparation and skillful use of the fires of all weapons and favorable terrain. The main defensive position (or killing zone) is one upon whose firm retention the success of the defense depends. In this connection, the main defensive force is concentrated where the enemy's main attack is expected. Therefore, on a given avenue of

approach, they plan to concentrate fire, particularly of highly accurate weapons, air strikes, a majority of armor and anti-tank weapons, and the preparation of anti-tank obstacles and barriers. Early remote mining is also suggested.

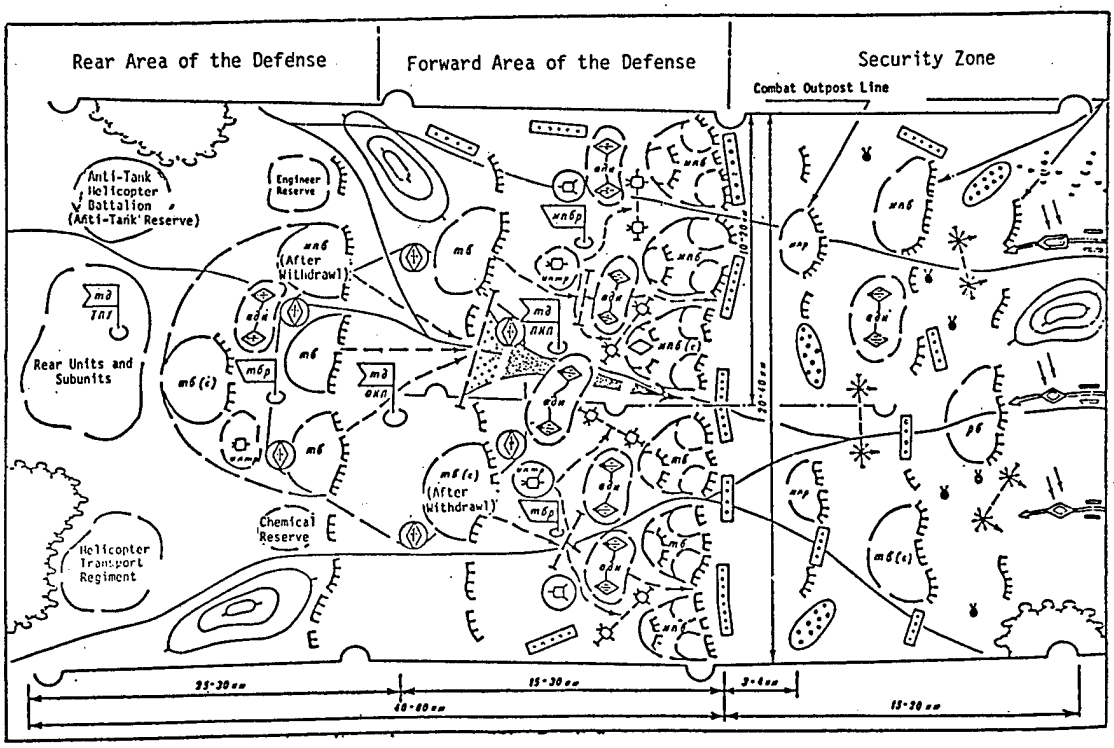



тб - Tank Battalion
тб(с) - Tank Battalion (Reinforced)
тбр - Tank Brigade
адн - Artillery Battalion
мпб - Motorized Infantry Battalion
иптр - Anti-Tank Company
ТД / ПКП - Armored Division Forward CP
ТД / ОКП - Armored Division Main CP
мпбр - Motorized Infantry Brigade CP
мпб(с) - Motorized Infantry Battalion (Reinforced)
мпр - Motorized Infantry Company
рб - Cavalry Battalion

Figure 1. Combat Formation of a Bundeswehr Tank Division in the Mobile Defense (Example).

In the view of the Bundeswehr leadership, the tank division is capable of successfully conducting defense, having a fixed composition (two tank and one motor infantry brigade, an artillery regiment; cavalry engineer, and two infantry battalions). It comprises more than 300 tanks, about 400 IFVs, APCs

and CFVs, about 160 ATGM launchers, more than 100 fixed artillery pieces and mortars and other weapons and other combat equipment. In conducting the defense, it may be reinforced by corps with two artillery battalions, a transport helicopter regiment, an assault helicopter battalion, and engineer organizations. Also, the division's combat activities will be supported by tactical air, which could amount to 100 sorties per day.




тб - Tank Battalion
тб(с) - Tank Battalion (Reinforced)
тбр - Tank Brigade
адн - Artillery Battalion
мпб - Motorized Infantry Battalion
иптр - Anti-Tank Company
ТД / ПКП - Armored Division Forward CP
ТД / ТПУ - Armored Division Rear CP and support units
ТД / ОКП - Armored Division Main CP
мпбр - Motorized Infantry Brigade CP
мпб(с) - Motorized Infantry Battalion (Reinforced)
мпр - Motorized Infantry Company
рб - Cavalry Battalion

Figure 2. Defensive Formation of a Bundeswehr Armored Division in a Position Defense (Example).

As the foreign press shows, the tank division in the defense is given a defensive area, the dimensions of which depend on the composition, the mission, terrain, the expected composition of the enemy attacking force and the actual operational/tactical situation. If the division is in the corps' first echelon, then it may be given an area 20-40 km on the front and 40-60 hours in depth. Brigades in its first echelon normally occupy an area 10-20 km wide and 15-30 km deep. The principal elements of the defense are the security zone, the forward area (the areas of the first echelon brigades), and the rear area the position of the second echelon brigade).

The division security area (15-20 km) is created in the absence of direct contact with the enemy in order to hide the actual location of the FEBA, to inflict maximum losses, and to delay the attacking enemy on the approach to the defense with the covering force, and to force him to deploy and reveal the location of his main attack. Within its boundaries, they will prepare battalion positions for conducting holding, security positions, temporary field artillery positions, and will create a system of the various principal types of tank barriers. In corps defensive exercises conducted in recent years, the security zone of an armored division in its first echelon contained its cavalry battalion and a motor infantry brigade, which comprised the division second echelon. The combat outpost line (located 3-4 km forward of the FLOT) has up to one motor infantry company per brigade. In the forward defensive area (15-30 km) are located the brigades of the division first echelon, field artillery firing positions, SAMs and air defense units, antitank barrier lines are constructed, and counterattack avenues are prepared. In the rear defensive area (25-30 km) are located the division second echelon (reserve), assault helicopter battalion, reserves, tactical air cavalry (if its use is planned), and support units.

The armored division defensive formation usually includes a first echelon, second echelon (combined arms reserve), field artillery group and air defense, tactical air cavalry, and reserves.

In developing the division combat formation in two echelons, the first echelon contains one tank and one motor infantry brigade with reinforcements, and in the second echelon, a tank brigade, which is in battalion positions, prepared to counterattack or to stop an enemy penetration. In a single- echelon formation, all three brigades are located in the first echelon. A combined arms reserve will have one or two tank battalions.

The field artillery group, including organic and attached elements, is designated for fire support of the first echelon brigades and for combat with enemy artillery, tanks, APCs, and anti-tank weapons. Artillery battalion positions are located 4-6 km behind the FLOT.

The Air Defense group (air defense regiment) has the mission of covering combat units, CPs, artillery positions, etc., from air strikes.

Air cavalry is composed of an infantry battalion (or company) and an attached transport helicopter regiment. It may be used to reinforce a brigade in a threatened sector, for holding important position on the FLOT, flanks or in

depth, as well as for combatting air assaults and spetsnaz, operating in the division rear area.

An anti-tank reserve can include an anti-tank company from a second echelon brigade or an assault helicopter company attached to the division. Its principal mission is the destruction of tanks, APCs, and other armored targets.

The engineer reserve (one or two companies) with attachments is designated for construction of engineering, mainly anti-tank obstacles and removing the effects of enemy nuclear detonations.

The chemical reserve usually includes an organic chemical defense company.

Bundeswehr specialists believe that defense is, most of all, combat with tanks. In their opinion, anti-tank and other positions must be prepared throughout the entire depth of the defense and across the entire front calculating the necessity of developing the greatest volume of fire on tank avenues of approach and maneuver of them during the course of the battle. Therefore, the appropriate attention should be given to proper selection of terrain and maximum use of defensive assets to increase the robustness of the anti-tank defense, to the complex employment of anti-tank assets and their echelonment in depth, creating an effective system of anti-tank fire, to wide use of anti-tank mine barriers, to the required creation of anti-tank mine barriers, to the required creation of anti-tank reserve, and to their flexible employment in battle.

As noted in the West German military press, one of the main missions of the anti-tank fire systems in the defense is the fact that its affect on tanks and other armored targets conducted at long ranges from the defense will increase as they approach the defense, and a dense anti-tank fire zone should be created forward of the FLOT by calculating the various ranges of weapons which must be integrated with the barrier system and natural obstacles. An important place in the division anti-tank defense is occupied by assault helicopters. They are suggested for use primarily for destroying advancing or penetrating enemy tanks, as well as for locations where there are no anti-tank assets or where they cannot be used due to the nature of the terrain.

It is recommended that much attention should be paid to creating a system of fires which is the total of carefully prepared and coordinated, in terms of mission, location and timing, fires (conventional or nuclear) using organic, attached, and supporting weapons. They are organized such that they at once inflict deep damage on the enemy force at maximum range and ensure a continuous and increasing effect on the attacker. It is believed that a system of fires should provide fire support to the force in the security zone, repel a massive tank and motor infantry attack, cover open flanks and gaps baetween units, maneuver fires to a threatened area, and support a counterattack. It normally includes the fires of field and anti-air artillery, anti-tank and rifle fires, tactical and enemy air with precision weapons.

Engineer preparation of the division defensive area is very important. It is emphasized that this effort will involve personnel from the combat units. Engineer organizations can be used to support them in performing complicated fortification construction and for building division and brigade CPs. The degree of engineer preparation of the division defensive area is determined by the commander's guidance, the available time and troops, the terrain, situation, etc.

When time permits, all types of engineering are carried out in the forward defense area, including construction of battalion positions and strong points, which are prepared for all-around defense. For tanks and artillery, alternate positions, besides their principal firing positions, are also excavated. At command posts, light bunkers and foxholes are dug, and cover is provided for equipment. For motorized infantry, connecting trenches, fox holes, and bunkers. In the rear area, maximum use is made of terrain, defilade for troop and equipment positions. West German military specialists believe that organizing a hasty division defense requires 6-8 hours, and to create a system of barriers, personnel positions, comouflaging and preparing routes for maneuver up to two days, and for fully preparing the defense, four to five days.

CONDUCTING THE DEFENSIVE BATTLE. As noted in the Western military press, an armored division defensive battle usually starts with battle in the security zone (in the absence of direct enemy contact) and battle beyond the defensive area.

Battle with the attacking enemy is considered to begin from the moment of its entry into the zone of responsibility of the defender's weapons. The first blows are struck by air strikes and missiles allocated by a higher command. The defender increases the effects of his fires as the enemy approaches and as his organic and attached fire support enters the fray.

Upon the enemy's approach to the security zone, the division commander refines his guidance on the defense, coordination and order of operations. The highest importance is given to timely and effective employment of fires on the main enemy formations with the goal of weakening his striking power and maneuverability and to take the initiative in the battle.

The first to join the battle is the covering force, which, utilizing prepared positions and barriers, conducts a delaying action, attempts to inflict maximum casualties on the enemy, delay his advance, force him to prematurely deploy to combat formations, and reveal his formation and location of the main attack. The extent of combat of the covering force is determined by their mission, composition, terrain and obstacles, and attacking forces. In all cases their principel mission is to slow the advance, and, as long as possible, to delay the enemy approach to the division main force. From exercises, it has been learned that units on a covering force managed to hold up an advancing enemy for 20-24 hours.

Covering units conduct delaying actions and subsequent withdrawals from one phase line to the next, attempting to mislead the enemy as to the true location of the main defensive position. Its last position in the security

zone is the combat outpost line, from which it withdraws, having accomplished its mission. Activities of the covering force are controlled by the division commander, who even determines the moment when they should withdraw toward the rear to their designated position.

With the arrival of the enemy at the leading edge of the division defensive area, its main forces join the battle. Massive fires and air strikes are placed on the enemy in an attempt to break his organized attack.
If the division is conducting a position defense, when the enemy goes on the attack, an attempt is made to inflict maximum possible losses on him with fire support, to hold defensive positions, and stop the enemy forward of the FEBA, forcing him to discontinue his attack.

West German military specialists believe that repelling the attack and fighting to hold the forward battalion positions are the most crucial phases of this defensive battle. Attacking tanks and IFV (APC) are destroyed by ATGM and tank fires. Tank and infantry battalions attempt to separate enemy infantry and tanks with massive fires and to prevent the enemy from penetrating and consolidating inside the defensive area. The enemy, having run headlong into strong points, is destroyed by all available means.

If the enemy penetrates the defense, the division commander takes all measures to stop him, using barriers and natural obstacles, remote mining, and anti-tank fires, and prevent the movement of his tanks and infantry either on the flanks or to the rear, and to deny him the possibility of rupturing the defense.

In positional defense, great significance is attached to the correct use of the counterattack, which should result in decisive success for the defending force. However, the decision to counterattack is properly made when the enemy intentions, the location of his main attack, and his combat formation are revealed.

If the enemy succeeds in penetrating the company strong points of the battalion first echelon, then, given the total situation, a counterattack may be conducted by the brigade second echelon (reserve), to stop and destroy the enemy or force him to withdraw, if measures taken earlier have not succeeded. In case of an enemy victory in the battalion defensive position and the threat of a penetration of the first echelon, the division commander decides to counterattack with his second echelon (reserve) to destroy the penetrating enemy force.

Counterattacks are best conducted into the flank of the attacker in earlier prepared locations. If the enemy has succeeded in achieving several penetrations, then counterattacks should be conducted sequentially, destroying one group after another. In this case, units defending in the vicinity of the counterattacks may participate in the enemy's defeat.

In cases where the counterattack is not successful, the division commander takes all measures and uses all of his forces and assets to stop the enemy and to create favorable conditions for the corps counterattack. In cases where the enemy has achieved a major penetration, the division second echelon

(reserve) counterattack may be conducted in coordination with the corps counterattack. Counterattacks, as a rule, are supported by field artillery fires, air strikes, and, in unlimited war, nuclear weapons.

In an armored division, mobile defense, employing striking power, maneuver of forces and fires, the enemy is destroyed largely within the defensive area. Brigades and battalions, judging by reports in the foreign press, do not attempt to hold separate defensive positions. Rather, the main attention is focused on effectively inflicting strikes on the enemy and counterattacking.

In Bundeswehr commanders' views, upon initiation of the enemy attack, the battalions of the first echelon operating in the area where destruction of the enemy main attack is planned, fall back defending a series of positions, forcing the enemy to attack into the selected killing zone. On the perimeter of the killing zone, they encounter a tough defense which attempts to prevent further penetration.

West German military specialists believe that after the enemy is stopped, he can be destroyed by air strikes, artillery fires, ATGMs, tanks, and counterattacks by the division second echelon (reserve), as well as by units located in the area of the counterattack. It is recommended to counterattack one or both flanks of the penetration. When success is achieved, divisional units return to the original FEBA, and, having restored the position, prepare to repel possible follow-on enemy attacks. The order of subsequent operations by the armored division will depend on the situation. It may continue to defend, or, regrouping its forces, go on the attack according to its mission and the commander's concept.



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BRITISH ARMOR EQUIPMENT

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 27-34

[Article by Col N. Fomich; "British Armor Equipment"]

[Text] Great Britain is one of the active participants in the aggressive NATO bloc. This state's conservative government follows the lead of American imperialism in foreign policy. The English leaders continue to build up the strength of their forces, paying special attention to providing the most modern forms of armored equipment to their army.

According to reports in the foreign press, at the present time there are 3 armored, a motorized infantry and an artillery division, 13 independent motorinfantry and airborne brigades, and other units in the army, which numbers 161,500 personnel.

The British Army has about 1,300 tanks, the majority of which (more than 900) are CHIEFTANs. In March 1983, they started to field a new tank, the CHALLENGER, designed on the base of the SHIR-2, which is, in turn, an improved version of the CHIEFTAN. The first order was for 250, but then this number was increased to 307. In total the plan is to buy enough CHALLENGERs so that by the end of the decade they will be approximately half of the British Army's tank force. By the mid-90s they intend to have a new tank which will replace the remaining CHIEFTANs.

The obsolete CENTURIAN is now used mainly in training. Cavalry units have SCORPION light recon tanks (more than 270) and a whole family of combat and specialized vehicles built on its chassis. Along with these are used the FOX wheeled armored cars (about 200) and old FERRETs and SALADINs.

The principal means of transporting infantry is the tracked APC TROJAN (numbering nearly 2,400 including vehicles built on its chassis). At the present time the Army is producing the SAXON wheeled APC. Altogether they plan to buy about 500. In 1985 production began on a new infantry combat vehicle, the MCV-80 WARRIOR, which is planned to replace some of the older TROJANs, which have been in the inventory for more than 20 years. The Army intends to turn out more than 1,000 such IFVs.

As noted in the Western press, Britain has considerable experience in designing and producing armor. The British tank industry satisfies the demands of not only their own army, but sells their products to other countries as well. In the 70s CHIEFTANs were bought by Iran (more than 700), Kuwait and Oman, Up to the present, Jordan has received 274 HALID tanks--this is a SHIR-2 with a new fire control system. The Vickers firm, which has produced its models for export, has sold the VICKERS Mk3 to Kenya (76) and Nigeria (72). Earlier more than 70 VICKERS Mk1 tanks were sold to Kuwait. About 12 countries have SCORPION light tanks in their inventories.

Foreign specialists note certain distinctions in English armor. In particular, in designing a tank, the British pay particular attention to powerful armament and reliable armor protection, relegating mobility to the third consideration. This is explained by the English concept of the tank in battle which amounts to believing that the tank, exposed to fire from the enemy, "should force it to stop its opposition." And, although speed is one of the main characteristics it should not, in the opinion of English specialists, be obtained at the expense of armor protection since in close battle, tanks move very slowly. However, that is not to say that in Great Britain the requisite attention is not paid to mobility. One of the main objectives in modernization of the CHIEFTAN was increasing the power of its engine, and consequently, increasing its speed and maneuverability.

The CHIEFTAN main battle tank has been in the inventory of the British Army for more than 20 years. As noted in the foreign press, the best developments employed earlier in the CENTURION were employed in its design. The CHIEFTAN has classic components, however its characteristic is that its driver is in a reclining position. That makes it possible to reduce the height of the driver's compartment by increasing the angle of the top of the glacis. On the whole, in the opinion of English specialists, the CHIEFTAN has reliable armor protection, although that has led to greater weight. Crew protection from weapons of mass destruction is provided by a filter system and an overpressure system in the tank. The sides of the tank and the tracks are covered by antishaped-charge screens.

The main armament for the CHIEFTAN is the 120-mm rifled cannon, stabilized in two planes which permits firing on the move. It has in its basic load armor piercing discarding sabot and shaped charge antiarmor rounds with plastic explosive. The use of different sized rounds permits mounting the cannon in a comparatively small turret and increase the basic load to 53 rounds. Also, as noted in the foreign press, use of different sized rounds instead of unitary, increases the rate of fire. Rounds are stored in special fire-protected racks, The cartridge cases are fully consumed in burning. An ejection system activates upon firing to clear the crew compartment of smoke and gasses.

There is a 7.62-mm machine gun for use against personnel targets. There is also a coaxial 12.7-mm machine gun. On the commander's cupola an antiair 7.62-mm machine gun is mounted. On the side of the cupola there are two six-barrelled grenade launchers for laying smoke.

For observation, controlling fires on designated targets and subsequent fires on them, the gunner uses a monocular periscope with 8-power magnification or a

telescopic sight with 7-power magnification. The tank commander has a telescopic sight with 1- to 15-power magnification, which is connected with the gunner's sight for fire control. In night conditions crew members use IR devices.

The tank has a 700-hp 6-cylinder, multifuel engine. The transmission is mechanical. The suspension is standard with springs and shock absorbers. Tracks are made of metal sections with rubber pads. Water obstacles up to 4.5 m deep can be crossed with the use of snorkeling equipment.

As reported in the foreign press, the CHIEFTAN has had several product improvements, directed mainly toward increasing its mobility and fire power by increasing the power of its engine and adding a modern firecontrol system, adding a laser range finder, a ballistic computer, and IR sight. A tank retriever and armor vehicle launched bridge were designed on its chassis.

The CHALLENGER main battle tank, in foreign specialists' opinion, significantly exceeds the CHIEFTAN in its combat capabilities, especially in terms of protection and mobility. Its hull and turret are made from Chobham composite armor. It has steel screens for defense against shaped charge munitions. In the center of the front part of the hull is located the driver's compartment. The driver, as in the CHIEFTAN, is in the prone position in combat situations. Part of the ammunition is located around his compartment.

On the forward part of the turret to the right and left of the main gun are 5-barrel grenade launchers for smoke. In addition, systems of on-board smoke grenades called VIRSS for Visual and Infrared Screening Smoke (up to 6 per side) underwent testing in 1985, on the CHALLENGER. This is designed to create a screen both in the visual and IR regimes for various acquisition and aiming devices. Each system has 20 short tubes. Grenades fired one at a time at short intervals, detonate 25 m in front of the tank forming a smoke screen. It has been noted that this same system can be used on other armored vehicles.

The L11A5 120-mm main gun in the turret is an improved version of the CHIEFTAN gun. At present there is work going on to develop a new gun of the same caliber which would achieve a higher intial velocity with its APFSDS round.

The basic load of the CHALLENGER is 53 rounds of APFSDS, HEAT, shaped charge, and smoke. The majority of its rounds are APFSDS (32). It is reported in the foreign press that English specialists are developing a 120-mm APFSDS round with a depleted uranium rod.

The fire control system includes a laser range finder and a ballistic computer. The gunner has an auxiliary aiming telescope. The tank commander uses a periscopic sight (with a stabilized field of view) which is connected to the principal gunner' sight. In certain situations the tank commander may take control of fire himself and fire on a selected target. As the INTERNATIONAL DEFENSE REVIEW noted, CHALLENGER tanks now being produced are equipped with gunner's thermal sights. Thermal images of the locale are available to the tank commander as well. Future plans call for adding a CO2 laser rangefinder for use in conditions of reduced visibility.

To increase the effectiveness of firing on the move there is a 2-plane stabilizer for the cannon using electric drive. The maximum speed of vertical movement is 6 deg/sec, and horizontal slewing--24 deg/sec.

The CHALLENGER tank is also armed with two 7.62-mm machine guns. One is coaxial with the main gun and the other (air defense) is mounted over the commander's hatch. Basic load is 4,000 rounds.

The tank has a 1,200 hp V-12 diesel engine. It has a hydraulic transmission with four forward speeds and three reverse. Replacing the transmission under field conditions with the help of a recovery vehicle takes about 45 minutes. In order to increase the tanks maneuverability it is intended to replace the transmission with an improved version with six forward and two reverse gears. Also, an automatic system for controlling the function of the engine and the transmission will be installed.

Running gear consists of a hydraulic suspension and tracks. On each side there are six roadwheels and four supporting wheels, as well as a track with metal links and rubber pads. It is reported in the foreign press that an experimental track with rubber-metal joints with long life has been tested.

Vickers has developed a tank recovery vehicle on the CHALLENGER chassis. It has special equipment, including a strong tow hook and a crane. The latter, in particular, can be used for disassembly or changing the engine. There is a space on the vehicle for carrying a spare tank engine. The first six pre-production vehicles are planned for early next year, and after 1988, there will be 24 on hand. The total requirement for the British Army is calculated to be 125.

Although Vickers produces principally for export, its production capacity has also been directed to producing parts for the CHIEFTAN and models built on its chassis.

Vickers developed the Mk3 in the late 60s, which differs from the first two models in its new turret design, and has a better shape, an improved firecontrol system, a more powerful engine, and improved maneuverability. Its main gun is a rifled 105-mm cannon (L7A1), stabilized in two planes. Coaxial with it is a 7.62-mm machine gun, and there is a second such machine gun mounted on the rotatable commander's cupola. Basic load for the machine gun is 50 rounds. The gunner has a laser rangefinder.

In 1980, the British Army acquired the Vickers experimental VAKIANT tank, which had been developed for export, for demonstration. It had the so-called "adapted" armor. Its hull and turret were made from aluminum alloy, and on the front and sides it was reinforced with Chobham. According to the wishes of the buyer, it may be armed with either the 105-mm or 120-mm cannon. The basic load for the weapon is either 60 or 44 rounds respectively. The modern firecontrol system includes an infrared vision device. The engine has 915 hp.

At the present time, according to reports in the Western press, Vickers is continuing to work on improving the Mk3 (an improved model has already been

seen), and is testing the Mk7. Jointly with the American firm Food Machinery Corporation [FMC] it is reworking the Mk5 light tank (combat weight, 20t), armed with a 105-mm rifled cannon.

The experimental model CHIEFTAN 900, designed for sale to other countries, was produced at the national tank arsenal in Leeds, in 1982. It had composite armor on the hull and turret, and a combat weight of 56 tons. It had the same armament as the CHALLENGER. Its engine produced 900 hp.

SCORPION LIGHT RECONNAISSANCE TANK was produced by Alvis in 1982. A whole family of light armored vehicles was developed on its chassis: the SCIMITAR cavalry vehicle, the STRIKER self-propelled launcher for the SWINGFIRE ATGM, the SPARTAN APC, the SULTAN command vehicle, SAMARITAN ambulance, and the SAMSON recovery vehicle.

The SCORPION light reconnaissance tank's armor is made from aluminum alloy. It protects the crew from small arms and artillery fragments. The engine and transmission are located in the front part of the vehicle.

This tank has a 76-mm cannon and a coaxial 762-mm machine gun. The basic load principally consists of HE plastic rounds. For combat with light armor targets and personnel, there is a fragmentation round. To the right and left of the cannon, there are mounted two 3-tube grenade launchers. The commander's and gunner's positions are equipped with the necessary observation and sighting devices. For firing at night, there is a low-light sight.

A 6-cylinder carborated engine serves as the power source. The transmission has seven gears for forward and reverse. The suspension is torsion bar with hydraulic shock absorbers on the front and rear road wheels. The tank crosses water obstacles using an individual swim system (movement in the water is accomplished by track movement.) The SCORPION is air transportable.

There are a lot of different wheeled armored vehicles in the British Army. For reconnaissance, communications and training, the FERRET and SALADIN armored cars, built in the early 50s, are still in use. Also, the foreign press notes, at present only a few of the obsolete SALADIN armored cars remain in service since they have been replaced by the SCORPION.

In the early 70s, Daimier developed the FOX wheeled 4x4 armored reconnaissance vehicle on the chassis of their earlier armored car, the FERRET. The FOX was fielded by the British, Iranian, Kenyan, Nigerian and Saudi Arabian armies. Its hull and turret are made of aluminum. A 30-mm automatic RARDEN cannon and a coaxial 7.62-mm machine gun are mounted in the 2-man turret. In its basic load (96 rounds) are APFSDS and HEAT rounds.

The FOX has a carborated engine (the same as in the SCORPION), and a five-gear transmission. The suspension is independent beam with coiled springs and telescoping shock absorbers. The vehicle may be equipped with a navigation system and equipment for detecting radio activity and chemical weapons. A 2B298 ground radar may also be placed on it.

As noted earlier, for infantry transport, the tracked TROJAN APC is used. There are also some 60 obsolete SALAZAR armored transports in the army.

THE TROJAN APC was accepted in 1963. Its covered hull is made from 6- to 12-mm thick armor. On its left front section, the engine and transmission are mounted, and in the rest is the troop compartment, over which is a circular hatch covered by a 2-layer fallout armor roof. For entry and exit by infantrymen. there is a door in the side. A 7.62-mm machine gun is mounted on the commander's hatch. The APC has a radio, a filtered ventilation system, and a night vision device for the driver.

The APC has a multifuel engine made in one unit with the gear box, and a torsion bar suspension. The tracks have metal-rubber hinges and synthetic rubber pads.

A family of vehicles was developed on its chassis: command, recovery, evacuation and ambulance, 81-mm mortar carrier, and a carrier for the SWINGFIRE ATGM. (Early in 1986, it was taken out of service).

Judging by reports in the foreign press, the SPARTAN tracked APC (built on a SCORPION chassis) did not replace the TROJAN. It is used principally in reconnaissance regiments (12 vehicles in each, of which 5 have ZB298 radars), as well as for transporting crews of portable BLOWPIPE air defense missiles and engineer assault groups, transporting SWINGFIRE ATGM to reinforce STRIKER portable launchers.

The SPARTAN APC is armed with a 7.62-mm machine gun mounted on a commander's turret. It has a crew of three. Four infantrymen can be carried in the troop compartment.

Early in the 1980s, a launcher for the MILAN ATGM was developed on the SPARTAN chassis. Over the troop compartment is is a specially built turret, on whicn is mounted a sight and two rails for MILAN missiles (another 11 ATGMs per vehicle). For firing at night, a low-light level sight can be used. The British Army plans to have 75 such launchers.

Employing their SCORPION light reconnaissance tank technology, Alvis, on an initiative arrangement, developed the STORMER tracker APC. In the early 80s, 25 of these vehicles were sold to Malaysia, and three models, equipped with the American M242 25-mm automatic cannon (mounted on the 2-position turret), were bought by the USMC for experimentation and evaluation for possible fielding.

The main STORMER model has a covered hull, made of aluminum armor. Eight fully-equipped infantrymen can be carried in the troop compartment. It has a crew of three. On the commander's turret is mounted a 7.62-mm machine gun. Alvis proposed 14 models of armored vehicles which could be built on this chassis. In 1986, the British Army selected the STORMER for the carrier of the improved STARSTAKE short-range air defense missile. The launcher will hold light missiles with a range of 7 km. A total of 50 of these self-propelled launchers will be bought for air defense in tank and mechanized units.

The SAXON (before 1982 it was called the AT-105) wheeled (4x4) armored transporter of the British Army is an improved model of the AT-104 APC which was developed in the early 70s for police organizations. On the new vehicle, the body construction has been changed, the armor for the engine compartment has been improved, the bottom has been strengthened against mines, a more powerful engine has been installed, and the wheel base has been somewhat reduced to improve maneuverability.

On the forward part of the welded armored body of the SAXON APC, are the engine compartment and the driver's compartment. Behind him is the commander in an armored turret on which a 7.62-mm machine gun may be mounted. Eight fully-equipped infantrymen are transported in the troop compartment. They enter and exit through a door (on the side of the body), which has observation and firing ports for firing without leaving the vehicle.

The APC uses a 6-cylinder diesel engine and automatic transmission. The suspension uses semi-electric springs and hydraulic shock absorbers.

As reported in the foreign press, the SAXON chasis serves as the foundation for command, recovery and ambulance vehicles. Besides the British, it is in the armies of Bahrein, Kuwait, Malaysia, and Oman.

In the early 60s, the firm GKN Sarky began development of the MCV-80 WARRIOR IFV, which was adopted by the British Army in 1985. In its components it is similar to the American M-2 BRADLEY. The engine compartment occupies the front of the vehicle. The driver's comparment is in front, also, on the left. The commander and gunner occupy the 2-man rotating armored turret. Seven infantrymen ride in the troop compartment.

The enclosed welded vehicle body is made from aluminum alloy, and the turret is made from steel armor. The main armament of the IFV is a BARDEN 30-mm automatic cannon, which also is used on the FOX and SCINITAR. There is a coaxial 7.62-mm machine gun. The basic load of the vehicle consists primarily of anti-tank and fragmentation rounds. On the sides of the forward section of the vehicle are mounted two 4-tube grenade launchers for smoke. The commander and gunner have combination (day and night) periscope sights.

A V-8 diesel engine is the power source for the vehicle. It is mounted together with the automatic hydraulic transmission.

Running gear includes 6 road wheels (disks made from hardened aluminum alloy) and three tension wheels. The drive wheel is forward. Suspension is independent torsion. Tracks, with rubber-metal hinges and synthetic rubber pads.

The IFV is equipped with a radio and a filtered ventilation suystem. Currently, a family of tracked armored vehicles is being developed on its chasis, including command, engineer, recovery, 81-mm mortar, HOT ATGM carrier, and artillery fire direction vehicles. In 1984, in Belgium, an experimental version of this IFV was developed with a 90-mm cannon mounted on a new 2-man armored turret.

PRINCIPAL TACTICAL AND TECHNICAL CHARACTERISTICS OF TYPES OF BRITISH ARMOR

| Item, Year Fielded | Combat Weight, t / Crew, Personnel | Height, m. / Length[1] X Width | Caliber of guns, mm: Cannons / Machine guns | Engine hp | Maximum Speed, kph / Range, km |
|---|---|---|---|---|---|
| CHALLENGER Main Battle Tank, 1983 | 60 / 4 | 2,9 / 8,4 × 3,5 | 120 / 2 × 7,62 | 1200 | 56 / 500 |
| CHIEFTAN Main Battle Tank, 1963 | 55 / 4 | 2,89 / 7,5 × 3,6 | 120 / 2 × 7,62; 12,7 | 750 | 48 / 500 |
| CHIEFTAN-900 Tank[2] | 56 / 4 | 2,44 / 7,52 × 3,5 | 120 / 2 × 7,62 | 900 | 52 / . |
| VICKERS Mk3 Tank[2] | 38,7 / 4 | 2,5 / 7,5 × 3,2 | 105 / 1×7,62; 12,7 | 720 | 50 / 600 |
| VALIANT, Tank[2] | 43,6 / 4 | 2,64 / 7,5 × 3,6 | 105 или 120 / 2 × 7,62 | 1000 | 60 / 600 |
| CENTURION, Tank[3] | 50,7 / 4 | 2,9 / 7,6 × 3,39 | 83,4 / 2 × 7,62 | 650 | 34 / 190 |
| SCORPION, Light Cavalry Tank, 1973 | 8 / 3 | 2,1 / 4,8 × 2,2 | 76 / 1 × 7,62 | 195 | 80 / 640 |
| SCIMITAR Tracked Cavalry Vehicle, 1975 | 7,75 / 3 | 2,1 / 4,9 × 2,2 | 30 / 1 × 7,62 | 195 | 80 / 640 |
| WARRIOR MCV-80 Infantry Fighting Vehicle, 1985 | 24 / 3 (7) | 2,7 / 6,3 × 3 | 30 / 1 × 7,62 | 550 | 75 / 500 |
| TROJAN Tracked Carrier, 1963 | 15,3 / 2 (10) | 2,28 / 5,2 × 2,8 | — / 1 × 7,62 | 240 | 52 / 480 |
| SPARTAN Tacked Carrier, 1975 | 8,2 / 3 (4) | 2,28 / 5,1 ×2,25 | — / 1 × 7,62 | 195 | 80 / 480 |
| STORMER Tracked Carrier[2] | 11,6 / 3 (8) | 2,49 / 5,28 × 2,3 | — / 1 × 7,62 | 250 | 72 / 640 |
| SAXON Wheeled Carrier, 1984 | 10,6 / 2 (8) | 2,6 / 5,2 × 2,5 | — / 1 × 7,62 | 164 | 96 / 510 |
| SARAZIN Wheeled Carrier, 1953 | 10 / 2 (10) | 2,4 / 5,2 × 2,5 | — / 2 × 7,62 | 160 | 72 / 400 |
| VALKYRIA Wheeled Carrier[2] | 11,5 / 2 (8) | 2,3 / 5,6 × 2,5 | — / 1 × 7,62 | 180 | 100 / 700 |
| FOX Wheeled Calvary Vehicle, 1973 | 6,4 / 3 | 2 / 4,24 × 2,13 | 30 / 1 × 7,62 | 195 | 104 / 440 |
| SALADIN Armored Car, 1956 | 11,6 / 3 | 2,4 / 4,9 × 2,5 | 76 / 2 × 7,62 | 160 | 72 / 400 |
| FERRET Armored Car, 1954 | 4,4 / 2 | 2 / 3,8 × 1,9 | — / 1 × 7,62 | 129 | 93 / 300 |
| FERRET-80 Armored Car[2] | 6,6 / 3 | 2,57 / 4,45 × 2,3 | — / 1 × 7,62 | 158 | 96 / 560 |

1. Length of chasis.
2. Armor technology made for export.
3. Removed from Army units in 1966, used for training purposes.

According to reports in the foreign press, development of new armored vehicles continues in Britain. In recent years, the English firms of Vickers and Alvis have developed experimental forms of the VALKYRIE and FERRET-80 wheeled armored transports, and the state-owned tank factory (Leeds) has developed four models of the RO2000 family of tracked vehicles, including a light tank with a 105-mm cannon. They are mainly developed for foreign sales.

The technical characteristics of the British armored equipment described above are shown in the table.

On the whole, as noted in the foreign press, in Britain, development and producation of varies armored equipment is proceeding. This equipment is not only used to equip the British Army, but a significant amount is sold to other capitalist countries. In Western specialists' opinion, the armored equipment in the inventory of the British Army supports its conduct of combat operations on the modern battlefield.



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CSO: 1801/124

EUROPEAN NATO COUNTRIES' GROUND FORCES' TO&E

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 35-38

[Chart by Col V. Titov: "European NATO Countries' Ground Forces' TO&E"]

NATO COUNTRIES' GROUND FORCES TO&E

| FORMATIONS, UNITS, WEAPONS | | U.S.A. | Great Britain | FRG | France | Italy | Canada | Belgium | The Netherlands | Luxembourg | Norway | Denmark | Greece | Turkey | Spain | Portugal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 780.6 | 161.5 | 290 | 300 | 270 | 30.2 | 66 | 67 | 0.7 | 24 | 18 | 150 | 520 | 230 | 40 |
| Personnel (thousands) | | | | | | | | | | | | | | | | |
| Staffs: | | | | | | | | | | | | | | | | |
| Army | | 6 | — | — | 1 | — | — | — | — | — | — | — | 1 | 4 | — | — |
| Corps | | 6 | 1 | 3 | 3 | 3 | — | 1 | 1 | — | — | — | 4 | 10 | — | — |
| Divisions | | | | | | | | | | | | | | | | |
| Infantry | | 1 / 18 000 | — | — | 5 / 7000 | — | — | — | — | — | — | — | 11 / 12 500 | 14 / 12 000 | — | — |
| Light Infantry | | 4 / 10 700 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Motorized | | 1 / 14 500 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Motorized Infantry | | — | 1 / 17 000 | 4 / 21 000 | — | — | — | 2 / 16 000 | 3 / 17 000 | — | — | 1 / 15 500 | 1 | — | 1 / 20 000 | — |
| Mechanized | | 6 / 19 000 | — | — | — | 3 / 20 000 | — | — | — | — | — | — | — | 2 / 12 000 | 1 / 19 000 | — |
| Armored (tanks) | | 4 / 19 000 | 3 / 16 000 | 61 / 21 000 | 6 / 9500 | 1 / 16 000 | — | — | — | — | — | — | 1 / 9000 | 1 | 1 / 17 000 | — |
| Armored Cavalry | | — | — | — | 1 / 7000 | — | — | — | — | — | — | — | — | — | — | — |

| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Airborne (special forces) | 1/16 000 | — | 1/9500 | 1/8500 | — | — | — | — | — | — | — | (1) | — | — | — |
| Airborne Assault | 1/19 000 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mountain Troops (alpine) | — | — | 1/23 000 | (1)/9000 | — | — | — | — | — | — | — | — | — | 2/14 000 | — |
| Airmobile | — | — | — | 1/7000 | — | — | — | — | — | — | — | — | — | — | — |
| Detached Brigades | | | | | | | | | | | | | | | |
| Infantry (motorized) | 4 | (14) | — | — | (5) | (2) | — | 1 | — | (1)/5000 | (2)/5000 | 1 | 11 | 4 | (1) |
| Armored | — | — | — | — | 2 | 1 | — | — | — | — | — | — | 4 | — | — |
| | 1 | — | — | — | — | — | — | — | — | — | — | 3 | 6 | (1) | — |
| Airborne | — | 1 | — | — | 1 | — | — | — | — | — | — | — | 1 | 2 | — |
| Anti-Tank Helicopter | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Artillery | 9 | — | — | — | — | — | — | — | — | — | — | — | — | 2 | — |
| Air Defense | 5 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Rocket-Howitzer | — | — | — | — | 1 | — | — | — | — | — | — | — | — | — | — |
| Alpine | — | — | — | — | 5 | — | — | — | — | — | — | — | — | 1 | — |
| Special Designation (Commandos) | — | — | — | — | — | 1 | — | — | — | — | — | — | (1) | — | 1 |
| Detached Units and Subunits | | | | | | | | | | | | | | | |
| Groups (Regiments) of Forces of Special Designation | 4 | (1) | — | — | — | — | (1) | — | — | — | — | — | — | — | — |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detached Armored Cavalry Regiments | 3 | — | — | — | — | — | — | — | — | — | — | — | — | | — |
| RANGER Regiments | 1 | — | — | — | — | | — | — | — | — | — | — | — | — | — |
| Regiments (Battalions) | | (6) | | | (6) | | (3) | | (1) | (3) | (1) | 1 | | | 14(3) |
| Divisions (Regiments) | | | | | | | | | | | | | | | |
| PERSHING-1A | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| PERSHING-2 | 3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| LANCE | 8 | (1) | 4 | — | — | — | 1 | 1 | — | — | — | — | — | — | — |
| PLUTO | — | — | — | (5) | — | — | — | — | — | — | — | — | — | — | — |
| HONEST JOHN | — | — | — | — | — | — | — | — | — | — | — | 2 | 4 | — | — |
| PATRIOT | 3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| IMPROVED HAWK | | — | — | (3) | (2) | — | 2 | — | — | — | — | 2 | — | — | — |
| RAPIER | — | (3) | — | — | — | — | — | — | — | — | — | — | — | — | — |
| ROLAND-2 | — | — | (3) | (5) | — | — | — | — | — | — | — | — | — | — | — |
| GEPARD | — | — | (12) | — | — | — | 2 | | — | — | — | — | — | — | — |
| Primary Weapons | | | | | | | | | | | | | | | |
| Launch Batteries, including | | | | | | | | | | | | | | | |
| PERSHING-1A | 36 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| PERSHING-2 | 108 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| LANCE | 72 | 12 | 26 | — | 6 | — | 5 | 6 | — | — | — | — | — | — | — |
| PLUTO | — | — | — | 44 | — | — | — | — | — | — | — | — | — | — | — |
| HONEST JOHN | — | — | — | — | — | — | — | — | — | — | — | 8 | 18 | — | — |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tanks | 13 500 | 1300 | 4000 | 1600 | 1700 | 200 | 450 | 1000 | . | 150 | 250 | 1800 | 3700 | 1000 | 70 |
| Field Artillery Pieces | 5500 | 500 | 1300 | 700 | 1300 | 300 | 300 | 500 | . | 400 | 350 | 1300 | 2200 | 1100 | 700 |
| Mortars | 7500 | 450 | 950 | . | . | . | . | 350 | . | . | . | 1000 | 1800 | 1200 | : |
| Anti-Tank Weapons | 17 000 | . | 3000 | 1500 | 1700 | 950 | 400 | 600 | . | . | 650 | 1000 | 3000 | 500 | : |
| Army Aviation Helicopters | 9000 | 300 | 750 | 650 | 300 | — | 70 | 100 | . | — | 20 | 100 | . | 150 | — |

NOTES:

1. The table does not include Iceland, which does not have armed forces.
2. In the table entries having fractions, the numerator is the number of divisions (brigades) and the denominator is the approximate number of their personnel. Approximate quantities of combat equipment is given as installed.
3. Not included in the table for the U.S. ground forces are the U.S. National Guard (more than 450,000 personnel, 10 divisions, 17 detached brigades, 4 detached armored cavalry regiments, and the units and subunits of the U.S. Army Reserve (about 300,000 personnel), in other countries, the territorial forces and reserve components are not included.
4. Canadian armed forces are divided into six functional commands: mobile (includes ground force formations, units and subunits, located on Canadian territory), Air Force, Navy, Canadian forces in Europe and signal.
5. The total number of infantry divisions in the French ground forces includes two training, one cadre of Netherlands motorized infantry divisions, and one Greek training infantry division.
6. The French "Rapid Deployment Force" includes five divisions (9th Marine Infantry, 11th Airborne Assault, 27th Alpine Infantry, 6th Armored Cavalry, and the 4th Airmobile), control and rear services units and subunits.
7. PERSHING-1A divisions (36 launchers) are deployed in the Continental U.S. and the PERSHING-2 (108 launchers), in the FRG.
8. LANCE regiments (Great Britain) have four batteries with three launchers each.
9. A LANCE division ( 6 launchers) are included in the Italian ground forces detached rocket-howitzer brigades.
10. The main battle tanks are: U.S., ARRAMS M1, M60A1 and A3; Great Britain, CHALLENGER and CHIEFTAN; FRG, LEOPARD-1and LEAPOARD-2; France, AMX-30 and AMX-30B2. The remaining countries have in their inventory tanks of U.S., West German, British, and French production, mainly of earlier issue.

APPEARANCE OF THE FUTURE FIGHTER

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 39-47

[Article by Col L. Andreyev; "The Appearance of the Future Fighter"]

[Text] Striving for military superiority over the Soviet Union and other countries of the socialist brotherhood, the U.S. and its allies of the aggressive NATO bloc are paying a great deal of attention to the development of future weapon systems, including fighters which have surpassed the Soviet aircraft of the same designation in their flight performance characteristics and weapons employment effectiveness.

As the foreign press notes, they are trying to solve the problem of the "cost/effectiveness" criterion in the conceptual design stage. Actually, it is a struggle of joint concerns and individual firms to obtain recurrent profits from the production of equipment, and of military departments of the U.S. and its NATO allies to obtain quality and quantity. To a certain extent, this relates to the problem of developing a future tactical fighter. Several aspects of this process, that is, Western specialists' views on a future fighter, are set forth below. According to their opinions, the appearance of a new combat aircraft will be determined by the developmental level of the probable enemy's aviation technology and the capabilities of its own military-industrial complex. In the process, of course, requirements based on purely military concepts must be considered. Stemming from the later, tactical-technical requirements (TTT) are formulated for weapon systems, including for tactical fighters.

Foreign specialists believe that a TTT for a future tactical fighter is complicated because it is impossible to assess exactly the characteristics of the probable enemy's future combat aircraft and to determine the missions which a new aircraft will be called upon to execute during its service life. In considering this circumstance, air force specialists of the U.S. and other NATO countries consider that the main requirement for a new fighter is to be able to achieve superiority in close-in aerial combat, but also be able to effectively destroy ground targets. The foreign press explains such a requirement in part by the fact that close-in aerial combat can arise when executing any combat mission, and that a fighter's capabilities must also be used in other situations encountered frequently, as for example, when evading

air defense missiles; when accelerating at the moment of the pursuit of the air enemy or the break-away from a danger zone. Hence, it is concluded; a fighter must have a good basis for modifying it into a multipurpose aircraft. During the design process, the attainment of superiority in close-in aerial combat must be provided, not by the individual flight feature advantages, but by the general superiority of the aircraft as a weapon system. Therefore, when formulating the TTT for the fighter abroad, besides optimizing the aircraft to execute this mission, it is planned to adapt it to execute other missions which are uncharacteristic for it.

The foreign press presents examples of such an approach. Specifically, it is planned to have an internal fuel supply on new aircraft which will be sufficient to execute 80-90 per cent of all missions, and to provide the capability to suspend external fuel tanks used for long-range sorties. In another case, the requirement to detect and identify the air enemy beyond visual range has come to the forefront of aerial combat. As a result, it will be necessary to have the the appropriate systems on aircraft which will provide reliable information on the enemy and which permit it to detect the enemy and open fire on him first, etc. But this inevitably leads to the aircraft's technical complications. Simultaneously, foreign specialists are attempting to make the development process for new fighters cheaper, resorting to the use of a number of methods aimed at reducing an aircraft's life cycle cost as a weapon system by providing the capabilities to subsequently improve its automated production and servicing.

According to foreign experts' views, a future fighter must execute not one, but several missions, namely; conduct combat with aerial targets (at all altitudes); achieve air superiority and escort friendly fighters; deliver strikes against ground targets when rendering direct air support to the ground troops, when isolating the battlefield and delivering strikes against targets in the enemy`s deep rear.

In spite of this, when generating the main TTT for a future tactical fighter, individual military experts of the U.S. and of several other western governments proceed as if its main purpose is to be an air combat aircraft. For example, over a number of years, specialists of the West German firm Messerschmitt-Bolkov-Blohm (MBB) have studied the possible nature of the aerial combat logic of future fighters, in order to correctly generate the requirements for their conceptual development. For this, they modeled aerial battles and carried out flight experiments. The obtained results, discussed in the foreign press, have significantly changed Western experts' views on the methods of conducting aerial combat by new-generation fighters. In their opinions, above all a future fighter must surpass the probable enemy's aircraft in close-in aerial combat, since, in the future, combat, which will begin at long and medium ranges, will carry over into close-in combat. Western military experts' views are presented below on the requirements for a future fighter for close-in and group aerial combat, and also several ideas on aerial combat at medium-ranges.

As Western experts figure, close-in aerial combat by a new-generation fighter will be characterized by the use of new short-range all-aspect missiles and also onboard cannons, which is demonstrated by the aircraft's execution of

special maneuvers and the use of integrated flight and fire control systems. It is noted, that currently for victory in CLOSE-IN-AERIAL COMBAT with the use of conventional missiles, the fighter's advantage over the air enemy in angular velocity of a sustained turn is required in order to gain a favorable possition for an attack from the rear hemisphere. From this it should be noted, that the aircraft's combat effectiveness depends to a large extent on its thrust-to-weight ratio and wing loading. The same effectiveness in the use of all-aspect missiles, according to Western specialists' opinions, depends on the fighter's capability to execute an entire set of non-sustained maneuvers. Therefore, when designing a future fighter, a great deal of attention is paid to increasing its lift, reducing its wing loading and providing the thrust-to-weight ratio for executing non-sustained manuevers.

The West German firm MBB modeled a large number of close-in aerial battles using all-aspect missiles to study this issue. According to their results, a graph was constructed from which it is clear, that the greatest capability for missile launches using IR guided missiles lie in the forward hemisphere (Fig. 1). Consequently, an attacking aircraft must gain a position almost for a frontal attack. Accordingly, high maneuverability will be required for a future fighter.

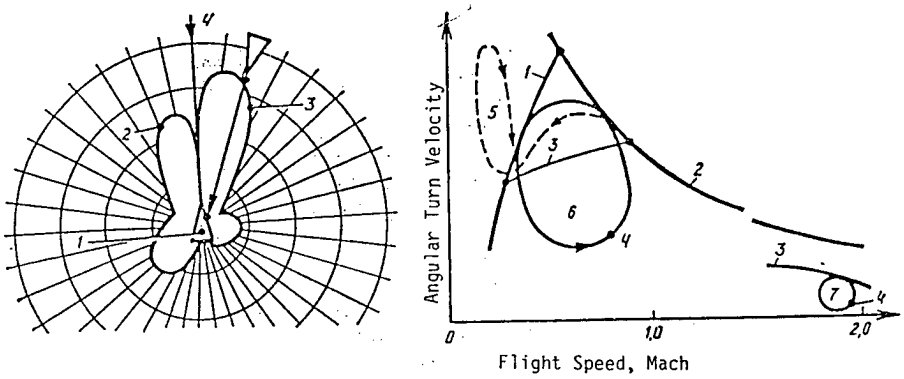


Figure 1. ON THE LEFT: The zone of possible missile launches of all-aspect IR-guided missiles in close-in aerial combat. 1. The air target; 2. The one-on-one aerial combat zone; 3. Four-on-four aerial combat zone: 4. Frontal attack direction.

ON THE RIGHT: A future fighter's horizontal manuver capability: 1. Life limitations 2. Endurance limitations. 3. Zero overpower; 4. Possible missile launch boundary; 5. critical mode zone; 6. Close-in aerial combat zone; 7. Medium-range aerial combat zone.

COMBAT AT MEDIUM RANGES. Foreign specialsts considered, that a fighter's maneuverability does not play a crucial role when using medium-range, semi-active homing guided-missiles. However, in modeling aerial combat they became convinced, that an aircraft's combat effectiveness with a new-generation guided-missile is increased significantly when executing maneuvers at a high

supersonic speed. In such combat, the missile's launch range exceeds by far the aircraft's turning radius, and the enemy is not able to gain a favorable position. But the fighter must maneuver intensively in order to gain a more favorable position with respect to the target's direction, altitude and flight speed, and to avoid entering into the operational envelope of its weapons, and at the same time, enabling it to guide it's missiles and have sufficient energy after the breakaway from the missile launch boundaries for a repeat attack. In similar conditions, combat at a medium range will be saturated with moderate-load, sustained maneuvers at supersonic speeds and high altitudes. In order to execute such combat, an aircraft must possess a low wave drag and have such a wing load that provides it with a maxixmum flight speed during a sustained maneuver (with an acceptable load) with any achievable thrust-to-weight ratio.

Thus, to provide superiority over the air enemy in close-in combat and combat at medium ranges, a future fighter must be able to maneuver lively at subsonic and supersonic speeds. These requirements, as the foreign press emphasizes, are contradictory since the aerodynmic surfaces, including the wing, which provide for maneuvering at supersonic speeds, are different from those which are necessary to achieve high maneuver effectiveness at subsonic speeds. In particular, its capabilities to execute a horizontal maneuver are limited to specific zones confirmed by the graph (Fig. 1, on the right).

GROUP AERIAL COMBAT was also included in the evaluation of a future fighter during its conceptual design. In such combat, a different correlation of forces, targets and missions can exist; the numerical equality or superiority of one side over the other with the same or different aircraft characteristics; combat against a combat formation of strike aircraft executing an important missions, etc. It is impossible to take into account all the various conditions. Therefore, foreign specialists are investigating several standard variations and are deriving the basis of a new fighter design from them. For example, in studying the modeling results of aerial battles on trainers between aircraft having various maneuverability characteristics, but equipped with the same radars and air-to-air missiles (under the conditions, that the enemies simultaneously detect each other), they came to two conclusions;

- with an increase in the number of aircraft in an air battle, superiority in manuevering affects the outcome of the battle less because the number of situations arising in which to use weapons increases;

- the danger exists from an enemy with prevailing numerical superiority, even if one's own aircraft are more maneuverable.

However, in the latter case it is emphasized, that if one's own aircraft are equipped with more effective weapons, longer range radars, or a system permitting information about the air enemy to be received earlier, then this can reduce the enemy's numerical superiority to zero.

In the second case, graphs were constructed based on combat operations models characterizing the capabilities of future air defense fighters (Blue) to repell mass raids of strike groups covered by fighters (Light Blue) over a 24-

hr period(Fig. 2, on the left). The following conditions were used to construct the graphs: The "Light Blue" aircraft combat formation comprised a group of 50 covering aircraft and a strike group of 50 aircraft; each aircraft conducted three sorties in a 24-hour period; the armament of the covering fighters and the air defense fighters (future air defense fighters equipped with more effective missiles) included two air-to-air missiles; the probability of destroying the air defense fighters and the covering fighters in close-in aerial combat was 0.2 and for the strike aircraft it was 0.4; the losses of "Light Blue" aircraft to SAMs on the average for the first sorties was 5 per cent; the number of strike aircraft, not able to execute the mission after participating in close-in aerial combat, was 50 per cent. In analyzing the graphs, specialists came to the conclusions:

-With a large numerical superiority in "Light Blue" covering fighters, the number of the strike aircraft breaking through was high.

-With an increase in the probability of destroying the "Light Blue" aircraft (from 0.2 to 0.4), the number of "Blue" air defense fighters required to achieve one and the same results was reduced;

-If the "Blue" air defense fighters were able to open fire first (the dotted lines), then their capabilities to destroy the strike aircraft increased. However, with a numerical superiority in covering fighters, this did not effect the number of aircraft breaking through to the target.

Based on this, it is concluded that success in group aerial combat is made possible not only due to numerical superiority, but also to better maneuverability and more improved onboard aircraft equipment, which gives them the capability to obtain information on the air enemy first.

Many foreign firms have developed their proposals to create a new-generation fighter on the basis of studying the experience of the research which has been carried out. The views and proposals of the specialists of the firms MBB (FRG) and Northrop (U.S.) are presented below regarding this issue.

MESSERCHMITT-BOLKOV-BLOHM investigated unconventional maneuver modes and developed the concept of "supermaneuverability" to solve, to some extent, the contradictions between a fighter's maneveuver characteristics at subsonic and supersonic speeds. Its specialists achieved the capability to deviate the longitudinal axis of the aircraft's fuselage from the flight path, to control the aerodynamic drag and to execute the aircraft's supercritical maneuver.

The fuselage's deviation (the foreign press calls such deviation "aiming the aircraft") implies the control of its angular orientation within specific limits irrespective of the direction of the flight velocity vector. In Western experts' opinions, this increases the capability to use cannons, since the zone for conducting fire from it and its duration is expanded, and also a high hit accuracy is provided, especially when the fire control systems automatically interacts with the flight control system.

As West German specialists figure, it is possible to control the aircraft's drag by slowing the aircraft (not resulting in the occurence of the

longitudinal moment) due to the deflection of the appropriate aerodynamic surfaces. With such braking, the aircraft's speed is reduced rapidly to a value which allows it to begin an unsustained turn. According to MBB's data, an aircraft capable of executing such a maneuver in close-in aerial combat, will be able to gain rapidly the favorable position for opening fire, and will be able to remain in this position longer for an attack on a target and less time when executing a defensive maneuver.

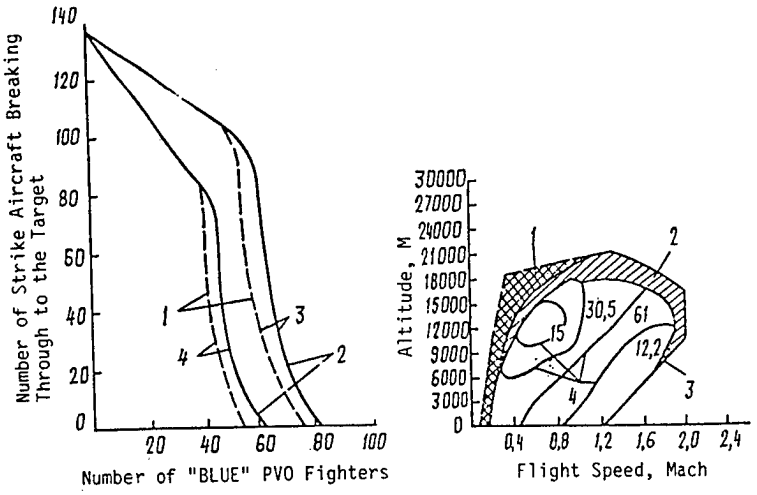


Figure 2. ON THE LEFT; The Capabilities of Future "Blue" Fighters to Repel a "Light Blue" Aircraft Raid: 1. "Blue" fighters open fire first; 2. Both sides open fire simultaneously; 3. The probability of destroying aircraft of both sides is 0.2; 4. The probability of destroying "Light Blue" aircraft is 0.4, and 0.2 for the "Blue" aircraft.

ON THE RIGHT: Possible Expansion of a Future Fighter's Employment Zones in Comparison with the Operational Zone of an F-16 Type Fighter: 1. Expansion of the zone due to thrust vector control of the engine and the use of an automated direct control system for the aerodynamic forces; 2. Expansion of the zone due to an increase in engine power and an improvement in the airframe's aerodynamic efficiency; 3. The boundary, limiting the modern fighter's operational zone (overpower is equal to 0); 4. Curves, characterizing the maneuver capabilities of a future fighter as a function of climb-rate (15, 30.5, 61 and 122 m/sec).

Based on mathematical modeling results of aerial combat with future "supermaneuverable" fighters of the 1990s, and aircraft of the 1970s, with conventional maneuvering capabilities, MBB specialists came to the following conclusions;

- aircraft, possessing "supermaneuverability," but with other characteristics equal, have a significantly greater effectiveness index;

- the effectiveness of 1990 fighters, when executing their maneuvers in conventional modes, depend, to a less extent, on the thrust-to-weight ratio and wing loading;

- the superiority of future fighters, executing conventional maneuvering, will be reduced substantially.

In their opinion, a better configuration for a future fighter is a design form based on the DUCK configuration with a delta wing and a controlled forward horizontal stabilizer. Such an aircraft will possess maneuverability characteristics at subsonic speeds comparable to those of modern fighters, but its better efficiency at supersonic speeds will increase the combat effectiveness at medium ranges.

Due to the "cost/effectiveness" criterion, the MBB's specialists concluded, on the basis of extensive research, that presently the main efforts to develop future fighters should be directed not at developing improved engines, but at finding aerodynamic structural designs which will support various maneuver modes, and also at working out tactical methods. They note, that in the near future it will not be possible to substantially improve the aerodynamic efficiency of a fighter at subsonic speeds (for this wing sweep) or to increase the maximum lift (with this wing area). The engines will have better maintainance characteristics, but their excess power characteristics will not be improved significantly.

The firm's adopted approach to the conceptual design of a future fighter is, to a certain extent, being implemented in the West European new-generation fighter development program. From the foreign press it is known that in December 1983, the chiefs of staff of the air forces of Great Britain, France, the FRG, Italy, and Spain signed a preliminary agreement on the joint development of such an aircraft and the document the "General Requirements of the Air Force Staffs of West European Countries for a New Fighter," laying out the agreements for the tactical-technical characteristics agreed on by them.

It should be noted from these documents, that the aircraft's main purpose is to achieve air superiority. However, it must be able to execute effectively the missions of delivering strikes against ground targets. For the preliminary requirements, it is envisioned to develop a highly-maneuverable, single-seat two-engine fighter based on the DUCK configuration with a planar delta wing and a shortened take-off and landing capability. It must have the following main tactical-technical characteristics; a maximum take-off weight of 17 tons (clean weight of 8.5 tons), a maximum flight speed of M>1.8, an operational radius of not less that 550 km, an available maneuver load (with a full internal fuel supply, two new medium-range guided-missles and a basic load for the cannon) from +9 to -3, a fuel supply in the internal tanks of 4 tons, a net load on the outside suspensions of 4.5 tons, and a take-off run and landing run of less than 500 m.

It is planned to produce the aircraft with reduced radar, infrared and visual signatures. It is planned to equip it with a multifunction pulse-doppler radar having a detection range against aerial targets up to 90 km (according to individual Western expert's opinions, up to 150 km) and stations for suspending air-to-air and air-to-ground guided missiles, bombs and other weapons. Besides this, it is planned to use one to two built-in cannons on it.

NORTHROP, as with MBB, believes that a future fighter must possess, above all, high effectiveness for combatting aerial targets, but at the same time, be capable of delivering strikes against ground targets. Its specialists are concentrating their attention on the allocation of a new aircraft with maneuver superiority at supersonic speeds by improving its power plant.

The firm has conducted many investigations in its laboratories to study the possibility of developing a tactical fighter with a relatively small cost. As a result, experts have concluded that a new highly-effective fighter must have a weight and cost close to that of fighters such as the F-5E and F-16, but possess more extensive employment areas. They think that such efficiency can be achieved mainly by improving aerodynamic features, improving the power plant and integrating the onboard systems. For this purpose, it is planned to use new materials to improve the power plant which can withstand high turbine inlet temperatures and large loads in the compressor stages, and to develop the aircraft's artificial stability in order to provide maneuver superiority, and also to integrate the flight control system, power plant and weapons system into a single automated complex.

Based on modeling results on the basis of these requirements, the firm's specialists drew up a graph (Fig. 2, on the right) of the possible expanded employment zones for a future fighter in comparison with the operational zones of the modern F-16 type fighter (with a 50 per cent fuel supply and maximum engine operational mode).

As the Western press reports, Northrop's specialists are paying attention in the conceptual design to: improve the aircraft's supersonic characteristics, use short- and medium-range weapons effectively, reduce the radar cross section (RCS), provide survivable take-off and landing characteristics, organize coordinated operations in group aerial battles and provide aircraft with reliable technical maintainance.

IMPROVING SUPERSONIC CHARACTERISTICS. It is considered, that a future fighter must have a supersonic flight cruise speed. In this case, the intercept zones for aerial targets are expanded, the fighter's survivability during operations in conditions of a heavy enemy air defense is increased and the probability of executing a successful attack during a chance encounter with the air enemy is increased. Fig. 3 (on the left) shows the graphs of the intercept boundaries for an aerial target flying at a speed of M = 1.5 at an altitude of 15,000 m with a direction perpendicular to the "front line." Northrop's specialists calculated these for a fighter-interceptor taking-off from a airfield alert posture and flying to the intercept point at cruise speeds of M = 1.0; 1.5; 2.0; and 2.5. It should be noted from the graph, that the successful intercept of an aerial target depends on the following factors: the possible flight time of the fighter-interceptor at this speed (the solid lines represent the

maximum flight time of an F-15, and the dotted lines that of a future aircraft); its reaction time, that is, the time from the moment of receiving the take-off command (on the left (A) the lines are given for a reaction time of five minutes, on the right (B) they are given for two mintues); the targets flight direction relative to the location of the airfield where the fighter-interceptor is based.

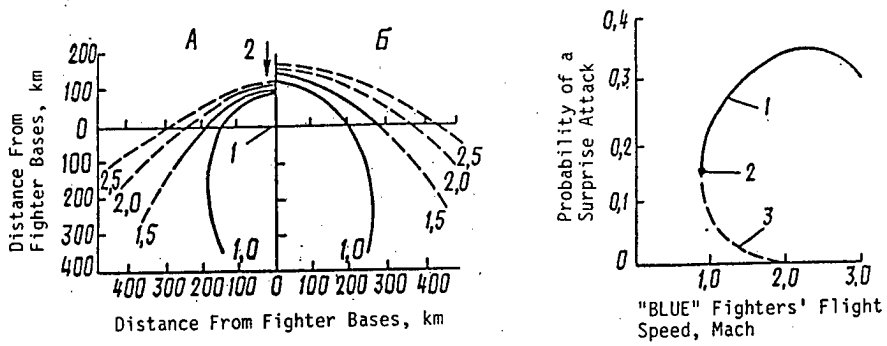


Figure 3. ON THE LEFT: The Boundaries of a Possible Supersonic Intercept of an Aerial Target (Its Flight Speed is M =1.5 and the Altitude is 15,000 m) by a Future Fighter; 1. The fighter's basing location; 2. Target's flight direction (A--with a fighter reaction time of 5 minutes, B--with a reaction time of 2 minutes).

ONTHERIGHT: The probability of the future fighter executing a surprise attack at various flight speeds (the enemy pursues at a speed of M = 0.9); 1. The future fighter attacks (solid line); 2. Speeds of both aircraft are equal (M = 0.9); 3. Enemy attacks (dotted line).

With regard to latter, the firm's specialists emphasize, that with "frontal" breakthroughs of air defenses (the target's flight route passes through the airfield), the success of the intercept to a great extent depends on the fighter's reaction time, and with breakthroughs at the side (along the front) of the airfield, the success depends also on the interceptor's reaction time and speed characteristics.

Additionally, calculations by the firm's specialists show that with a future fighter's increase in speed and reduction in the effective RCS, the probability of it being hit by antiaircraft missiles is reduced, that is, its survivability increases (in comparison with present-day aircraft).

The results of preliminary research to assess a future fighter's capabilities to execute a surprise attack are shown by a separate graph (Fig. 3, on the right). It is calculated for the following conditions; the visual detection range is 10 km; the attack is considered finished when the attacking aircraft is in the rear hemisphere of the aircraft being attacked (its flight speed is M = 0.9) for not less than 10 second at a range from it of not more that 10 km

with a difference in courses within the limits of plus or minus 90°. It can be seen from the graph, that with an increase in a future fighter's supersonic speed, the probability of an enemy's surprise attack grows (the solid line). But, from a specific increase line in supersonic speed, it begins to fall due to the fact, that the aircraft intersects the possible attack zone faster that 10 seconds. Additionally, the greater the speed of a future fighter, the less probable is its attack by an enemy (dotted line).

The weapons employment effectiveness depends on many factors, but in combat at medium ranges, primarily at the operational range of the onboard radars and on RCS. This relationship is illustrated in the graphs calcultaed by Northrop's specialists (Fig. 4). The graphs are constructed for an air-to-air missile with a firing range of 50 km (A) and 100 km (B). The foreign press notes, that the 100 km range is not feasible at the present time, so they stop at the range of 50 km. The graphs were drawn up for the following conditions; the "Light Blue" (enemy) aircraft has an RCS of 5 m., the approach occurs on meeting courses, the aircrafts' flight speeds are M = 0.9, and 15 seconds are allocated for missile launch preparation.

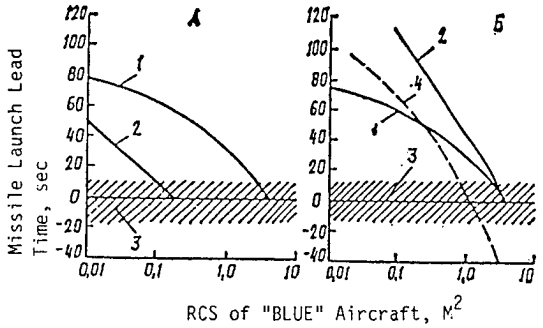


Figure 4. Graphs Depicting the Relationship of Missile Launch Lead Time on RCS and the Radar Target Detection Ranges of the "Blue" and "Light Blue" Aircraft. 1. Aircraft radar detection ranges of 50 km; 2. Aircraft radar detection ranges of 125 km; 3. A small lead is disregarded; 4. The "Blue" aircraft's radar has a target detection range of 90 km, and the "Light Blue" aircraft's radar has a detection range of 125 km.

As can be seen from graph A (curve 1), because of the smaller RCS, a future fighter (the "BLUE" aircraft) has greater advantages in the missile launch lead time when the radar target detection ranges of both aircraft are 50 km. These advantages are reduced noticeably if the target detection ranges of the aircraft radars are increased to 125 km (graph A, curve 2) for the reason that a missile launch can not occur immediately upon target detection (the firing range does not exceed 50 km). But, if the firing range and target detection range are congruent, then the advantage in the launch lead time is significant for aircraft with the lower RCS (Graph B, curve 2). At the same time, if the radar target detection range of the "BLUE" aircraft is 90 km, and that of the "LIGHT BLUE" aircraft is 125 km, then the "BLUE" aircraft, having an RCS equal to 1 $m^2$, has the advantage in weapons employment lead time. As a result, the firm's experts have concluded that it is possible to reduce the cost of an

aircraft cost with a small RCS by reducing the requirements for its weapons sighting characteristics, specifically, the radar.

REDUCING AN AIRCRAFT's RCS. Northrop attaches great importance to this problem. It thinks, that it is possible to make a fighter with an RCS equal to 0.1 $m^2$ by using "stealth" technology, which stipulates the use of radar absorptive materials and paints, and the elimination of straight angles and large planar surfaces from the airframe's design, etc. However, research conducted abroad shows, that the use of such technology leads to a specific degredation of the aircraft's aerodynamic characteristics. And, as the foreign press emphasizes, even a small increase in a fighter's drag or weight, places it in an unfavorable position in comparison with enemy aircraft, especially in close-in combat. Moreover, the firm's calculations show, that with a reduction in an aircraft's RCS by 50 or 75 percent, its radar detection range is reduced only 25 or 29 per cent, respectively, that is, a large reduction in RCS leads to a comparatively small reduction in its detection range by the enemy.

But all the same, American specialists figure, that aircraft with a smaller RCS, have advantages over aircraft with a larger RCS with respect to survivability and the capability to use weapons first due to their later detection by enemy air defense systems.

STRINGENT TAKE-OFF AND LANDING CHARACTERISTICS, in foreign specialists' opinions, are determined by the intensity of conducting combat operations in future wars. Modeling results of the possible degree of airfield runway damage from the delivery of strikes against them, with various intensity, during the first days of combat operations confirm that the dispersal locations, in comparison with permanent airbases, are more survivable, and a great part of the remaining runway sectons will have a length of 300-400 m. These results, as Western military specialists affirm, show the seriousness of solving the basing problem for combat aircraft. On this basis, they recommend increasing the effectiveness of airfield air defenses, more rapidly dispersing aircraft, and providing the capability for a future tactical fighter to operate from runways with a length on the order of 300 m.

Northrop is considering the factors examined above and several other factors in the conceptual design of a new fighter. Its proposals, and also the views of specialists of the six largest American aircraft manufacturing firms lie at the basis of determining the requirements for a future fighter.

Despite existing differences in the designs distinguishing their concepts, all of these firms have concluded that a future fighter must possess a supersonic flight cruise speed, high maneuverability, a reduced radar signature, and have effective radioelectronic supression equipment onboard. Its main performance characteristics are specified by the following parameters; the flight cruise speed must be M = 1.8 (in a non-afterburner mode); the maximum speed for an intercept must be M = 2.2; the operational radius must be 1,100-1,500 km (without suspension tanks); the take-off and landing distance must be 450-600 m; the front aspect RSC must be less that 5 $m^2$.

Stemming from the firms' proposals, the U.S. Air Force planned to select two or three of them for continuing development at the beginning of 1987, and at

the end of the 1980s, to select a firm for completing full-scale development. It is planned to complete the first flight of the future fighter prototype at the end of 1991, and begin its series production in 1994.



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MODERNIZATION OF U.S. AIR FORCE TACTICAL AIRCRAFT

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 47-51

[Article by G. Isayev; "Modernization of U.S. Air Force Tactical Aircraft"]

[Text] In the arms race being carried out by imperialistic circles of the NATO bloc, constant attention is being paid to improving tactical aviation, the aircraft which are presently one of the most important means of conducting a war using conventional and nuclear weapons. The development of the tactical aviation aircraft fleet is proceeding along the path of developing new and modernizing existing aircraft. Consequently, modernization is considered to be an essential reserve for increasing the effectiveness of resource expenditures, since, according to foreign specialists' opinions, it provides the required increase in aircraft combat capabilities with a comparatively low expenditure of time and material resources.

In the present stage, the role of modernization in the development of tactical aviation has significantly grown. Foreign experts explain this by the lengthening of the periods between the appearance of new aircarft into the armament and the more rapid aging of their onboard equipment and power plants due to the accelerated development of the scientific-technical base of aircraft construction, and also the NATO leadership's attempt to achieve military-technical superiority over the opposing systems of Warsaw Pact countries. They think, that under these conditions, due to modernization, it is feasible to increase the length of time existing types of aviation equipment can be employed.

Judging by foreign press reports, the greatest scope of operations to modernize tactical aircraft has been achieved in the U.S. Significant resources are allocated for this purpose. For example, 2,703.9 million dollars was allocated in FY 1984 for the purchase of new and improved equipment suites to modernize tactical aircraft of the American Air Force. In 1987, it is planned to increase this amount to 4,825.2 million dollars. These resources are being directed only for the modernization of aircraft assigned to forces. The combat capabilities of aviation equipment are also being increase by improving them during series production, which requires additional appropriations.

The increase in the importance of aircraft modernization under present conditions has resulted in the Pentagon undertaking a number of organizational measures to improve this process. Specifically, in 1981, the concept of "planned modification" was introduced. As American specialists figure, the new method for developing aircraft modifications will provide a large increase in the combat capabilities for a single time period in comparison with the traditional method. Besides this, it will permit technical innovations to be introduced into aircraft design more efficiently and with less expenditures. Previously, each modernization was carried out according to an individual plan, and at the same time, frequently, the next up-date was made more difficult. Now it is carried out according to a single plan and implemented continuously during an aircraft's service life--as the new components, intended for installation on an aircraft, are ready. With this, aging aircraft will undergo modernization first and work on aviation equipment located in combat units will be carried out during repairs. Depending on the complexity, modernization can be carried out at aircraft repair factories, in workshops, or directly at airfields.

Traditionally, new aircraft were developed without consideration being given to subsequent modernization. Therefore, they had limited strength reserves and insufficient free spaces to accomodate additional equipment, more powerful engines, future armament and an increased fuel supply. With "planned modification," the capability is provided for the purposeful reservation of strength, spaces, electric power sources and cooling system, etc. In foreign experts' opinion, during the development of a new aircraft, "planned modification" must have a lead time of at least 15 years from the moment of its introduction into the inventory, which requires an increase in the period and accuracy in forecasting the development of the scientific-technical base.

They believe that modifications can be planned in all phases of aircraft life cycles, but the greatest effect is achieved in the research and development stages. Such planning in the production and operational stages are a more complicated problem, since during these stages considerable alteration of the aircraft is required and less of an increase in flight performance characteristics is achieved. At the same time, in comparison with the traditional method, the new method provides a large effect during the modernization of aircraft already developed.

According to foreign press reports, not only the department of defense leadership, but also U.S. aircraft construction companies are interested in adopting the "planned modification" method. It is believed that this will permit a firm, contracted to develop a new aircraft, to avoid competition from other firms for the subsequent modernizaton of an aircraft after its series production has stopped. Such competitive fighting between aircraft construction firms, the Pentagon's traditional suppliers, has increased, especially in the post war years. This is explained by the fact, that new aircraft were developed substantially less freqeuntly than before, and several firms were deprived of profitable orders. At the same time, the American military leadership`s attempt to continuously improve existing aviation equipment opened the possibility to these firms to receive large profits by modernizing aircraft. They demonstrated a readiness to improve other aircraft, not only those made by them.

According to foreign press testimony, this phenomenon took on international dimensions since American firms imposed their services on various countries to modernization aircraft, whose armament included a large amount of older and not only American aviation equipment. It is considered for example, that prior to the year 2000, more than 3,500 F-4 fighters, approximately 3,000 F-5, 2,000 MIRAGE-3 and -5 fighters, a large number of A-4, and A-7 ground attack aircraft, and other aircraft will have to undergo modernization. Additionally, in the near future, the number of new F-15, F-16 and TORNADO aircraft will be increased, which will also have to be modernized over time.

The method of "planned modification" is being implemented, not only for the development of all future fighters currently under development, but also for the modernization of existing fighters. Primarily, it is used during the multistage program to improve the F-15 F-16 fighters.

The foreign press reports that the modernization of tactical fighters is being carried out along the following lines: an increase in the operational radius; an increase in maneuverability enabling the destruction of small aerial and ground targets; an increase in the number of targets destroyed on a single sortie; the simultaneous guidance of several guided-missiles to different targets; a reduction in the vulnerability of aircraft by expanding the maneuver capabilities after launching guided-missiles; the use of weapons with increased operational ranges which can be launched without entering into the enemy's air defense zone; the employment of future radioelectronic suppression systems; an increase in the accuracy of aircraft guidance and the employment of weapons, enabling aircraft to be used at any time of the day in bad weather conditions; a reduction in the crew work load by automating onboard systems; and an increase in the reliability and ease of repair of onboard systems. Information on the largest modernization programs for U.S. Air force tactical aircraft is presented below.

The F-15 EAGLE's series production makes provision for the multistage modernization program with new and improved armament, specifically, the AN/APG-63 onboard radar, a central computer, passive and active ECM equipment, and equipment of the JTIDS Joint Information Distribution System and the NAVSTAR satellite navigation system. The AN/APG-63 radar is equipped with a programmable processor, which allows several aerial targets to be tracked automatically and several AIM-120 guided-missiles to be guided simultaneously to various targets, including low-flying targets and small cruise missiles. It is also noted, that the radar is distinquished by better angular coordinate resolution (by a factor of 4-8) and can detect ground targets moving at a speed of not less than 5 km/hr. It is also planned to install the same equipment on F-15 aircraft produced earlier.

Special FAST PIKE fuel containers (two per aircraft) having a total capacity of approximately 4,500 liters are being installed on F-15C fighters comprising the so-called "rapid deployment force," which will permit them to execute Trans-Atlantic flights without in-flight refueling. Additionally, they are equiped with shortened, reduced-drag pylons, which increases the operational radius during a flight with a bomb payload. Additionally, the maximum speed at low altitudes has been increased to 1,145 km/hr.

As part of the modernization program, it is also planned to reequip 40 F-15A as carriers of the ASAT antisatellite missile, and to complete the development and put the F-15E fighter-bomber variant into production, retaining the capability to operate as air targets. The delivery of improved series-produced F-15C fighters into combat units began in 1985.

A further improvement in the F-15's combat capabilities is expected due to the use on it of an integrated flight and weapons control system, and also a digital power plant control system which is already undergoing flight tests. In American specialists' opinion, the first system will increase the accuracy of hitting a target by a factor of 2-3 and the duration of fire opposition by 3-4. Additionally, during the sighting process, the system will enable the automatic execution of an anti-aircraft system maneuver which will clearly increase the survivability of the aircraft during operations against ground targets by an order of magnitude. They think that the employment of the second system will reduce the time for taking the engines from the low gas mode to an afterburner mode (from 7 to 4 seconds), increase the reliability of turning on the afterburner, reduce the minimum flight speed with which it is possible to restart the engines (from 555 to 370 km/hr at an altitude of 900 m), and provide the automatic regulation of several engine parameters, thereby facilitating their servicing at a hardstand.

The foreign press has repeatedly noted the necessity to modernize the F-16 FIGHTING FALCON fighter, which is currently equipped to execute combat missions only in good weather. Since 1984, delivery has begun of improved F-16C aircraft, equipped with new equipment, including a central computer, a cooling system for the unit, and a binary multiplex information transmission bus system. Additionally, the improved AN/APG-68 radar with a programmable processor is being installed on them. In October 1985, work began to study the possibility of developing a new processor using high-speed integrated circuits, which will increase the number of the radar's modes of operations. The processor will have 50 per cent fewer components, which will increase its operational reliability.

F-16C aircraft are being manufactured with several design changes (to facilitate subsequent modernization) and are distinguished by an increased take-off mass. It is planned to equip the aircraft before 1988 with new AIM-20 air-to-air guided missiles, a future jamming system, equipment for the LANTIRN sighting and navigation, the JTIDS, and NAVSTAR systems, and the more powerful F110-GE-100 engine, a control system for onboard systems using voice commands, a wide-angle electro-optical display, a digital flight control system, and a computer with an increased memory capacity, and an automatic flight control system with a terrain following mode. In the 1990s, it is planned to install a display depicting the combat situation with a colored moving terrain map and a low altitude flight warning system on the aircraft.

It is planned to start the modernization program in 1987 for F-16 aircraft produced earlier. The production of these fighters will continue until 1992. In all, it is planned to build 2,651 aircraft, of which 1,866 will be F-16C models.

The modernization plans for the RF-4C, F-4D and F-4E aircraft stipulates their being equipped first with an improved sighting and navigation system, which includes new display equipment, a computer for navigation and bombing in bad weather, a laser gyroscope and other equipment. In the subsequent program stage, it is planned to equip the aircraft with electro-optical displays and receiving units for the NAVSTAR satellite navigation system.

The Western press reports that Boeing is working on the design to significantly improve the F-4 PHANTOM fighter's performance characteristics. It is considered that, as of result of equipping it with more powerful PW1120 engines, the F-4's thrust-to-weight ratio will be increased to 0.92, which will improve the acceleration, turning and take-off characteristics. The climb rate at ground-level will be increased to 259 m/sec. The operational radius will be increased by using a special 4,160-liter capacity non-jetisonable fuel tank under the fuselage, reducing the drag by 29 per cent in comparison with a conventional jetisonable tank. The installation of a new single-section canopy on these aircraft instead of a three section canopy will improve the crew's view substantially. It is also planned to strengthen the airframe structure in order to extend the aircraft service time.

F-4G WILD WEASEL aircraft were developed by reequipping F-4E fighters and are intended for detecting, locating, and suppressing enemy air defense radar systems. Mainly their modernization includes the improvement of the AN/APR-38 ELINT system. It will be equipped with a digital processor, a group of directional receivers, a computer with a higher speed of operations and greater memory capacity, and also additional on-line storage. A new central computer will be introduced into the aircraft's onboard equipment and the possibility of using a multiplex information transmission bus at the frequency of 1 MHz is also being considered. In all, additionally, it is planned to install 24 rapidly removable equipment modules on the aircraft. Besides that, it is planned to arm all F-4Gs with the HARM anti-radiation guided missile with an improved probability of destruction.

The modernization of the F-111 fighter-bomber is aimed at improving its combat capabilities and also at increasing the reliability and repairability of its sighting and navigation systems, since the existing analogue system is considered to be aging and its technical servicing requires all the more expenditures. It is planned to equip the aircraft with more effective and reliable equipment with digital information processing, including the AN/APG-67 radar, a terrain following radar, an interface unit between the sighting and navigation systems, and future display equipment. Additionally, a central computer, radio communications equipment, a warning system and others will be improved. It is planned to arm the aircraft with the improved AIM-9M SIDEWINDER short-range air-to-air missile for defense against enemy fighters. It is planned to deliver the first modernized F-111 to on-line units at the end of 1988.

It is also planned to implement a similar modernization during the same timeframe for the EF-11A EW aircraft. Apart from this, the AN/ALQ-99 jamming system will be improved on them, in which is its planned to use the principle of digital frequency memory to jam modern coherent type radars. The system's new pulse-timing generators will have more interference modulations and

concentrate the output power in a narrower freqency band. The processors will have an increased speed of operations and memory unit capacity. It is planned to introduce a digital converter in the receiving units.

The purpose of modernizing the A-10 THUNDERBOLT-2 is to permit flight at very low altitudes during the day and at night in bad weather, increase the aircraft's navigation accuracy, increase the detection and identification range against small-sized targets on the battlefield. Simultaneously, it is planned to reduced the pilot's work load by automating the onboard systems, permitting him to concentrate his attention on controlling the air situation. It has also been reported, that the aircraft will be equipped with a millimeter wave radar, the LANTIRN system, the LN-39 inertial navigation system, a television system for operations at dusk, and other instruments. The new equipment must support the use of a highly accurate laser, television and IR guided weapon systems and permit the pilot to execute manual piloting in a terrain following mode at low altitudes in bad weather.

It is planned to improve the A-7 CORSAIR-2 ground-attack aircraft made by Boeing by equipping them with a modern radar having a cartographic and terrain following mode, electro-optical display, and the ATLANTIC IR sighting and navigation system developed on the basis of LANTIRN.

The high-altitude TR-1 reconnaissance aircraft is equipped with the improved ASARS-2 side-looking synthetic aperture radar. The radar is distinguished by a increased range out to 130 km, a large field of view and improved resolution. Additionally, the aircraft are equipped with systems for employment in the PLSS reconnaissance-strike complex. It includes receiving and transmitting equipment, an interogator system for locating an aircraft, an automated system for transmitting information to a ground information processing station and the relay of guidance signals from the ground station to attacking aircraft or missiles.

In American experts' opinion, the work being carried out to modernize tactical aircraft will permit them to support combat capabilities on an adequately high level and enable their effective employment at least until the year 2000.



9355
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TO&E OF NATO COUNTRIES' AIR FORCES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 51-56

[Article by Col V. Sibiryakov; "TO&E of NATO Countries' Air Forces"]

[Text] In continuing the arms race and preparations for war against the USSR and other socialist countries, the U.S. military-political leadership and its allies in the aggressive imperialistic NATO bloc are continuously building up the power of their armed forces. Accordingly, a great deal of attention is being paid to the development of the air forces. Judging by foreign press reports, the combat capabilities of NATO countries' military aviation is increasing due to its being equipped with more modern aviation equipment and weapons, the modernization of existing inventory systems, the improvement of the control system and the organizational structure, and also the intensification in the combat training of units, formations and the air forces as a whole. As a result of these measures, as the foreign military press notes, in recent years noticeable changes have occured in NATO countries' air forces. In particular, the aircraft fleet has been significantly renewed and new weapons system have been deployed, etc.

For example, U.S. tactical aviation received hundreds of modern tactical F-15 and F-16 fighters, and all of the 713 A-10 ground attack aircraft discussed previously. Within the limits of the plans to build-up the strategic offensive nuclear forces, the so-called "Triad," the two basic components of which (ICBMs and bomber aviation) belong to the air force, the deployment of the new MX (at the beginning of 1987 it was planed to have 10 combat ready missiles on field launchers) has begun, the first B-1 strategic bomber subunits have been formed equipped with air-launched cruise missiles, and the existing B-52 aircraft in the inventory are being modernized. One hundred thirty one (131) of them are being refitted as cruise missile carriers. Simultaneously, the deployment of ground-launched cruise missiles is continuing. Currently, subunits of these missiles are located on Belgium, FRG and Italian territory. Preparations for their deployment in Belgium and the Netherlands are being carried out.

In following in the footsteps of its senior transoceanic partner, Western European countries which are members of the NATO bloc are also building up the combat power of their air forces. For example, approximately 500 new TORNADO

tactical fighters (in all 809 were ordered) have been delivered to the units and subunits of the British, West German and Italian Air Forces. New MIRAGE-2000 fighters are being delivered into the French Air Force armament and the MIRAGE-4P medium strategic bombers are being refitted to carry missiles with nuclear warheads. The air forces of Belgium, the Netherlands, Denmark, and Norway completed the reequipping of their units and subunits with F-16 tactical fighters (approximately 350 aircraft were delivered) and they have decided on the additional purchase of such aircraft.

| Aviation branch, weapons systems, aircraft and helicopters | Number of squadrons (aircraft, helicopters launchers on them) | Composition |
|---|---|---|
| 1 | 2 | 3 |
| UNITED STATES OF AMERICA[1] | | |
| Regular Air Force | | |
| (600,000 personnel, approximately 4400 combat aircraft, 1010 ICMBs and 128 ground-launched cruise missiles) | | |
| Intercontinental ballistic missiles (ICBMs) | 24 (1010) | 11 (550 MINUTEMAN-3), 9 (450 MINUTEMAN-2), 4 (10 TITAN-2) |
| Ground-launched cruise missiles | 8 (128) | 8 (128 BGM-109G) |
| Total... | 32 (1138) | |
| Strategic: | | |
| Bombers | 22 (320) | 1 (19 B-1B), 16 (241 B-52), 5 (60 FB-111) |
| Refueling | 34 (518) | 32 (487 KC-135), 2 (31 KC10A) |
| Reconnaissance, VKP | 10 (71) | 1 (9 SR-71), 1(7 U-2), 2 (14 TR-1), 5 (37 RC-135 and EC-135), 1 (4 E-4) |
| Total... | 62 (912) | |
| Military Transport: | | |
| Strategic | 17 (340) | 4 (70 C-5A and B), 13 (270 C-141B) |
| Tactical | 14 (215) | 14 (215 C-130) |
| Special purpose | 6 (48) | 3 (14 MC-130), 1 (10 AC-130), 1 (6 CH-3E), 1 (18 HH-53 and UH-1N and H) |
| Auxillary | 14 (325) | 8 search and rescue squadrons (23 HC-130, 45 CN-53, HH-3 and HH53: 76 UH-1H and HH-1, 9 UH-60), 3 medical transport (23 C-9), 3 weather reconnaissance (13 WC-130 and 5 WC-135), additionally, several independent transport subunits (8 C-135, 5 C-137, 1 C-6A, 5 C-12, 3 C-20A, 18 C-23, 11 C-140, 80 C-35 and CT-39) |
| Total... | 51 (928) | |

| 1 | 2 | 3 |
|---|---|---|
| Tactical: | | |
| Fighter-bomber and ground attack | 82 (1937) | 17 (408 F-4), 17 (408 F-15), 19 (481 F-16)<br>5 (72 F-4G WILD WEASEL), 10 (280 F-111), 14 (288 A-10) |
| Air defense fighters | 5 (90) | 4 (72 F-15), 1 (18 F-106) |
| Reconnaissance, AWACS, EW | 15 (216) | 8 (128 RF-4C), 4 (34 E-3A and B AWACS systems),<br>3 (7 EC-130, 11 EC-135, 36 EF-111) |
| Special | 13 (197) | 4 AGGRESSOR (74 F-5E and T-38), 9 target-designation and guidance squadrons, 8 (96 OV-10 and O-2A), 1 (27 CH-3) |
| Combat-training | 18 (400) | 1 (20 F-111), 3 (94 F-16), 7 (150 F-4), 1 (20 F-5)<br>2 (40 F-15), 3 (60 A-10), 1 (16 RF-4) |
| Total... | 133 (2840) | |
| AIR FORCE RESERVES<br>(74,800 personnel, 243 combat aircraft) | | |
| Fighter-bomber and ground attack | 11 (238) | 1 (26 F-16), 5 (112 F-4), 5 (100 A-10) |
| Transport | 16 (152) | 15 (143 C-130, 4 C-123K), 1 (5 C-5) |
| Refueling | 4 (34) | 1 (24 KC-135), 1 (10 KC-130) |
| Special and auxillary | 7 (55) | 1 (10 AC-130), 1 (6 CH-3E), 1 (7 WC-130),<br>4 (14 HC-130), 8 HH-3E and 10 UH-1) |
| Assigned to MAC subunits | 21 (-) | They do not have aircraft, but their crews are trained for flights on C-5 (4 squadrons), C-141 (13), KC-10 (3) and C-9 (1) |
| Total... | 59 (479) | |
| NATIONAL GUARD AIR FORCES<br>(107,900 Personnel, approximately 1,000 combat aircraft) | | |
| Fighter-bombers and ground attack | 35 (702) | 1 (18 F-15), 2 (30 F-16), 12 (188 F-4), 1 (12 F-4G WILD WEASEL), 14 (347 A-7), 5 (107 A-10) |
| Air defense fighters | 11 (198) | 7 (126 F-4C), 1 (18 F-15), 3 (54 F-106) |
| Reconnaissance | 6 (105) | 6 (105 RF-4C) |
| Transport | 20 (194) | 19 (182 C-130), 1 (12 C-5) |

| 1 | 2 | 3 |
|---|---|---|
| Refueling | 13 (102) | 13 (102 KC-135) |
| Special auxillary | 6 (128) | 3 (53 OA-37B), 1 (8 EC-130), 1 (8 HC-130), 1 (11 HH-3E), 40 T-33, 4 T-39, 4 T-43 |
| Total... | 91 (1,429) | |
| | GREAT BRITAIN (93, 750 personnel, more than 635 combat aircraft) | |
| Fighter-bombers | 17 (257) | 9 (148 TORNADO GR-1), 2 (43 BUCCANEER S-2, 18 in reserve), 3 (36 JAGUAR GR-1), 3 (32 HARRIER GR-3) |
| Air defense fighters | 9 (177) | 7 (96 PHANTOM), 2 (22 LIGHTNING, 36 PHANTOM and 23 LIGHTNING in reserve) |
| Reconnaissance and base patrol | 7 (55) | 2 (24 JAGUAR GR-1), 4 (28 NIMROD MR-1) and 2), 1 (3 CANBERRA PRS) |
| Refueling | 4 (31) | 2 (16 VICTOR K-2), 2 (9 VC 10-K and 6 TRISTAR) |
| Transport | 7 (77) | 1 (11 VC-10 and 3 TRISTAR), 4 (40 C-130H), 2 (7 ANDOVER, 6 HS-125, 6 PEMBROOK, 1 BAC-146 and 3 helicopters) |
| Combat-training | 14 (227) | 56 TORNADO, 9 BUCCANEER, 18 PHANTOM, 15 JAGUAR, 20 HARRIER, 3 NIMROD, 4 CANBERRA, 5 C-130, 8 VICTOR K-2, 72 HAWK, 5 CANTER, 2 JET PROVOST and 10 helicopters |
| AWACS and EW | 4 (49) | 1 (10 SHAKELTON AEW-2), of them 5 are in the reserves), 1 (31 CANBERRA), 1 (3 NIMROD), 1 (5 ANDOVER) |
| Helicopters (transport and search and rescue) | 7 (105) | 1 (20 ESSEX), 2 (26 PUMA), 2 (27 CHINOOK HC-1) 2 (14 SEA KING, 18 ESSEX) |
| Special and auxillary (including training) | (approx. 350) | 45 HAWK, 60 CHIPMUNK, 145 JET PROVOST, 45 other aircraft, and also approx. 50 helicopters |
| Aniaircraft missiles | 11 (136) | 2 (64 BLOODHOUND-2), 9 (72 RAPIER) |
| | FRG (109,000 personnel, approximately 600 combat aircraft) | |
| Fighter-bomber and ground attack | 20 (44) | 3 (90 F-104G), 4 (60 F-4F), 6 (81 TORNADO), 7 (126 ALPHA JET), reserves-- 47 ALPHA JET, 20 TORNADO and units of F-104G aircraft mentioned above |

| 1 | 2 | 3 |
|---|---|---|
| Air defense fighter | 4 (60) | 4 (60 F-4F) |
| Reconnaissance | 4 (58) | 4 (58 RF-4E) |
| Transport | 11 (193) | 4 (75 C-160 TRANSALL), 5 (92 UH-1D), 2 (4 Boeing 707, 3 C-140, 6 HFB-320, 3 VFW-614, 6 Do-28, 4 UH-1D) |
| Combat-training | 3 (50) | 2 (42 TORNADO), 1 (8 F-4E) |
| Special auxillary (including training) | . (182) | 65 Do-28, 35 T-37, 41 T-38A, 7 HFB-320, 34 P-149 |
| Operational-tactical missiles | 8 (72) | (72 PERSHING-1A) |
| Antiaircraft missile | 60 (432) | 36 (216 IMPROVED HAWK), 24 (216 NIKE HERCULES) |

FRANCE
13,200 personnel, 550 combat aircraft)

| | | |
|---|---|---|
| Medium-range ballistic missiles | 2 (18) | 2 (18 S-3) |
| Strategic bombers | 4 (36) | 4 (30 MIRAGE 4A and P, in the reserves and at a training center) |
| Fighter-bombers | 14 (216) | 8 (126 JAGUAR), 4 (60 MIRAGE-3), 2 (30 MIRAGE-F5) |
| Air defense fighters | 12 (175) | 2 (25 MIRAGE-3C and E), 8 (120 MIRAGE-F1C, 2 (30 MIRAGE 2000) |
| Reconnaissance | 4 (62) | 2 (30 MIRAGE-3R) and 2 (32 MIRAGE-F1R) |
| Transport | 7 (78) | 1 (6 DC-8F), 5 (62 C-160 TRANSALL), 1 (10 NORATLAS) |
| Refueling | 3 (11) | 3 (11 KC-135F) |
| Combat-training | . (354) | 30 JAGUAR, 21 MIRAGE-3, 14 MIRAGE-F1, 102 ALPHA JET, 187 MAGISTAR |
| Helicopters | 6 (84) | 48 (ALOUETTE-3, 27 PUMA and 9 others |
| Special and auxillary | . (approx. 400) | Light transport, communications, and training aircraft and helicopters (including combat training). |
| Air defense missiles | 12 (48) | 12 (48 CROTALE) |

| 1 | 2 | 3 |
|---|---|---|
| | ITALY<br>(70,500 personnel, 378 combat aircraft) | |
| Fighter-bombers | 6 (108) | 3 (54 TORNADO), 1 (18 F-104S), 2 (36 G-91) |
| Light ground-attack | 3 (51) | 1 (15 MB-339), 2 (36 G-91) |
| Air defense fighters | 7 (84) | 7 (84 F-104S) |
| Reconnaissance | 4 (43) | 2 (29 RF-104G), 2 (14 ATLANTIC) |
| Transport | 3 (45) | 2 (32 G-222), 1 (10 C-130H), 2 FALCON 50),<br>1 GULFSTREAM |
| Combat-training | 2 (34) | 1 (10 TORNADO)[2], 1 (24 TF-104G) |
| Special and auxillary (including training) | 11 (341) | 6 G-222, 14 PD-808, 4 C-47, 22 P-166M,<br>32 SIAI-208M, 2 DC-9, 50 G-91T, 95 MB-326<br>and MB-339, 30 SF-260M, 20 AB-47, 20 AB-204,<br>2 SH-3D, 25 AB-212, 19 CH-3 |
| Air defense missiles | 9 (100) | 8 (96 NIKE HERCULES), 1 (4 SPADA) |
| | CANADA<br>(38,300 personnel, approximately 180 combat aircraft) | |
| Tactical fighters (including training) | 9 (147) | 4 (56 CF-18), 3 (49 CF-116 A and D), 2 (42 CF-104) |
| Transport | 6 (49) | 4 (28 CC-130E and H), 1 (5 CC-137), 1 (7 CC-109, 1 C-132, 8 CC-144 |
| Transport (rescue) | 5 (37) | 5 (11 CC-115, 8 CC-138, 13 CH-113, 5 CH-135) |
| Shore-based patrol | 6 (33) | 4 (18 CP-140), 2 (15 CP-121) |
| ASW helicopters | 3 (35) | 3 (35 CH-124, of them 3 are in reserve) |
| General purpose helicopters | 6 (74) | 6 (31 CH-135, 36 CH-136, 7 CH-147) |
| Special and auxillary (including training) | . (205) | 2 CF-101, 3 CC-113, 4 CC-117, 111 CT-114, 7 CP-121, 2CC-119, 2 CC-129,<br>26 CT-133, 20 CT-134, 3 CH-113, 9 CH-118, 2 CH-135, and 14 CH-139 |

| 1 | 2 | 3 |
|---|---|---|
| | BELGIUM | |
| | (19,500 men, 181 combat aircraft, including 37 F-16 in the reserve) | |
| Fighter-bombers | 5 (88) | 2 (36 F-16), 3 (52 MIRAGE-5B) |
| Air defense fighters | 2 (36) | 2 (36 F-16) |
| Reconnaissance | 1 (20) | 1 (20 MIRAGE-5BR) |
| Transport | 2 (24) | 12 C-130H, 2 Boeing 727, 2 HS-748, 5 MERLIN 3A, 2 FALCON-20 |
| Helicopters | 1 (5) | 5 SEA KING (search and rescue service) |
| Combat-training and communications | 5 (83) | 2 (31 ALPHA JET), 2 (31 SF-260), 1 (21 CM-170 MAGISTAR) |
| Air defense missiles | 6 (36) | 6 (36 NIKE HERCULES) |
| | THE NETHERLANDS | |
| | (18,000 personnel, 210 combat aircraft, including 18 F-16 in reserve) | |
| Fighter-bombers | 5 (119) | 3 (58 F-16), 2 (61 NF-5A) |
| Air defense fighters (tactical fighters) | 2 (40) | 2 (40 F-16) |
| Reconnaissance | 1 (20) | 1 (18 F-16, 2 F-17MR) |
| Combat-training | 2 (40) | 1 (12 F-16B, 1 (28 NF-5B) |
| Transport | 1 (12) | 1 (12 F-27) |
| Helicopters | 1 (4) | 4 ALOUETTE (search and rescue service) |
| Air defense missiles | 14 (59) | 12 (36 IMPROVED HAWK), 2 (23 NIKE HERCULES) |
| | NORWAY | |
| | (9,400 personnel, 98 combat aircraft) | |
| Tactical fighters | 5 (98) | 4 (68 F-16), 1 (16 F-5 and 14 such aircraft in reserve) |
| Reconnaissance | 1 (7) | 1 (7 P-3B) |
| Transport | 2 (15) | 1 (C-130, 3 FALCON-20), 1 (4 DHC-6 and 2 UH-1B) |
| Helicopters | 4 (52) | 2 (26 UH-1B and 10 such helicopters in storage), 1 (10 SEA KING, search and rescue service), 1 (6 LYNX) |

| 1 | 2 | 3 |
|---|---|---|
| Combat-training | 1 (15) | 1 (15) SAFARI |
| Air defense missiles | 4 (36) | 4 (36 NIKE HERCULES) |
| | DENMARK<br>(7,000 personnel, 96 combat aircraft) | |
| Fighter-bombers | 5 (84) | 4 (64 F-16), 1 (16 F-35XD, 4 TF-35) |
| Reconnaissance | 1 (20) | 1 (16 RF-35XD and 4 TF-35) |
| Transport | 1 (13) | 1 (3 C-130H, 3 GULFSTREAM-3, 7 T-17) |
| Helicopters | 1 (8) | 1 (8 S-61A) |
| Training aircraft | 1 (15) | 1 (15 T-17) |
| Air defense missiles | 6 (36) | 6 (36 IMPROVED HAWK) |
| | GREECE<br>(24,000 personnel, approximately 300 combat aircraft) | |
| Fighter-bombers | 7 (137) | 3 (46 A-7H, 5 TA-7H), 3 (66 F-104G, TF-104G, 1 (18 F-5A, 6 F-5B |
| Air defense fighters | 7 (118) | 3 (47 F-4E), 2 (38 F-5A and B), 2 (33 MIRAGE-F1) |
| Reconnaissance | 3 (47) | 1 (16 RF-84F and 7 RF-4E), 1 (10 RF-5A and 2 RF-104), 1 (12 HU-16B) [3] |
| Transport | 3 (60) | 12 (C-130H, 6 YS-11, 12 C-47, 20 NORATLAS, 1 GULFSTREAM, 9 CL-215 and Do-28) |
| Helicopters | 3 (38) | 12 AB-205A, 2 AB-206A, 8 UH-1D, 5 BELL 47, 4 AB-212, 6 CH-47C |
| Special and auxillary | . (153) | 6 C-47, 48 T-33A, 20 T-41, 25 T-37B/C, 36 T-2E, 16 F-84F, 2 HUGHES 300 |
| Air defense missiles | 4 (36) | 4 (NIKE AJAX) |
| | TURKEY<br>(55,000 men, approximately 450 combat aircraft) | |
| Fighter-bombers | 19 (356) | 5 (90 F-4E), 10 (180 F-104G), 2 (46 F-5A and B), 2 (40 F-100) |
| Air defense fighters | 2 (32) | 2 (28 F-104 and 4 TF-104G) |
| Reconnaissance | 2 (28) | 1 (21 RF-5A and B), 1 (7 RF-4E) |

| 1 | 2 | 3 |
|---|---|---|
| Transport | 6 (76) | 1 (7 C-130E), 1 (20 C-160), 3 (40 C-47A), 1 (3 VISCOUNT, 2 AIRLANDER, 2 C-47A), 2 BEECH-18 |
| Combat-training | 2 (28) | 2 (4 F-104 and 24 F-5) |
| Special and auxillary (including training) | (approx. 250) | 82 T-33A, 2 C-47A, 40 T-38, 30 T-41, 35 T-37, 15 T-34A, 15 UH-1H, 5 UH-19B, etc. |
| Air defense missiles | 10 (88) | 8 (72 NIKE HERCULES), 2 (16 RAPIER) |
| | SPAIN (33,000 personnel, approximately 200 combat aircraft) | |
| Fighter-bombers | 2 (40) | 1 (21 MIRAGE F-1), 1 (13 F-5A and 6 F-5B) |
| Air defense fighters | 6 (111) | 2 (34 F-4C and 4 RF-4C), 2 (26 MIRAGE-3), 2 (47 MIRAGE F-1) |
| Reconnaissance | 3 (31) | 1 (16 RF-5A), 1 (9 HA-220), 1 (6 P-3A) |
| Combat-training | 2 (25) | 2 (25 F-5A and F-5B) |
| Transport | 8 (133) | 1 (7 C-212 and 2 Do-27), 5 (5 C-130H, 6 KC-130H[4], 6 CASA-207, 55 C-212 30 DHC-4, 12 Do-27), 2 (2 DC-8, 4 FALCON-20, 4 C-212) |
| Special and auxillary (including training) | . (429) | Aircraft: 86 C-101, 49 T-33, 45 T-6, 20 C-212, 48 Do-27 and Do-28, 6 O-1E, 12 CL-215, 2 DHC-4, 8 C-7, 3 F-27, 8 CASA-207 and 48 others. Helicopters: 20 AB-205, 25 AB-47, 5 PUMA, 11 SUPER PUMA, 4 AB-206, 3 ALLOUETTE-3, 18 Hughes 300 |
| | PORTUGAL (13,800 men, approximately 100 combat aircraft) | |
| Fighter-bombers | 4 (97) | 2 (48 A-7P), 2 (49 G-91) |
| Reconnaissance | 1 (4) | 1 (4 C-212B) |
| Transport | 2 (17) | 1 (5 C-130H), 1 (12 C-212) |
| Special and auxillary (including training) | 11 (147) | 1 (12 T-38), 1 (6 C-212), 2 (12 PUMA), 2 (37 ALOUETTE-2 and 3), 2 (26 FTB-3376), 1 (6 C-212 and 3 ALOUETTE-3), 1 (20 T-37C), 1 (25 CHIPMUNK) |

1. Besides the aircraft presented in the table, the U.S. Air Force (including the reserve components) has more than 30 combat-training squadrons and several experimental subunits, in which there are approximately 1800 aircraft. Besides this, more than 900 aircraft of various types are in active reserve storage.
2. Located at the Unified Retraining Center in Cottesmoure (Great Britain).
3. Older American amphibious reconnaissance aircraft. Operate in support of the country's navy.
4. Refueling aircraft, but the greater part are used as transport aircraft.

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BATTLESHIPS AND THEIR COMBAT EMPLOYMENT

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 57-62

[Article by RADM L. Vasyukov, Capt 1st Rank P. Lapkovskiy; "Battleships and Their Combat Employment"]

[Text] It was noted in the documents of the 27th Party Congress that the problem of war and peace is the foremost one facing mankind. International imperialism, headed by the U.S., continues to fuel, on an unprecedented scale, the race for nuclear and other arms. The policies of the White House became their most aggressive following the rise to power of the Reagan administration when in conjunction with a host of other military measures, it took steps to increase its naval armaments. By 1990, it is planned to have 600 active navy ships of various classes in the fleet. This fleet growth will not only be quantitative, but qualitative as well.

The American shipbuilding program places importance on the renovation, rearming, and recommissioning of the IOWA-Class battleships (BB). The foreign press has reported that the cost of putting one such ship into commission is about equal to the cost of building a SPRUANCE-Class destroyer (about 500 million dollars), but the combat effectiveness of the BB is 15-20 times greater. U.S. defense specialists consider that modernized battleships can remain in service in the active fleet until 2005.

IOWA (BB-61), first in a 6-ship series, was built in 1943, following which, in 1943-44, NEW JERSEY (BB-62), MISSOURI (BB-63) and WISCONSIN (BB-64) were placed into service. Construction of the final two (5th and 6th), ILLINOIS (BB-65) and KENTUCKY (BB-66) were deferred.

Each BB was armed with three 3-barrelled 406-mm turrets, two 2-barrelled 127-mm turrets and 20 sponson-mounted 40-mm automatic guns. The ships have a full displacement of 58,000 tons and a standard displacement of 45,000 tons. They are 270.4 m long, have a 33-m beam and draw 11.6 m. The steam power plant drives four shafts (includes eight boilers and four geared turbines) and has a rating of 212,000 hp which supports a speed of 33 knots. Cruising range is 5,000 miles at 30 knots and 15,000 miles at 17. Fuel supply is 6,840 tons, sufficient for three months. THe peacetime complement is 1,562, of which 62 are officers.

Battleships are assigned tasks of conducting combat actions against heavy enemy surface ships. However, toward the end of World War II, by dint of the increased role of strike aircraft carriers, battleships were assigned primarily for covering aircraft formations as well as for providing gunfire support during amphibiout assault operations. After the end of the war in the Pacific, three BBs were placed in the reserve fleet and MISSOURI (BB-63 was used for training.)

All four battleships took part in the aggressive Korean War (1950-53). Missions and tasks included blockading North Korean ports, control of sea lines of communications, shore bombardment against North Korean troop concentrations and anti-amphibious defensive positions, and destruction of shore installations.

Battleships were also employed in the U.S. aggression against Vietnam. NEW JERSEY, recommissioned in April, 1968, was, by October, conducting shore bombardment and continued to do so on and off for 120 days until June of 1969. The employment of NEW JERSEY in combat action in Vietnam was considered by U.S. naval specialists to have been necessary in order to conduct active and continuing fire support to ground forces and Marines, since these missions, in their opinion, could not be satisfactorily performed by any other force under the given circumstances.

The widespread use of the large caliber guns on surface ships against shore installations in Vietnam, in addition, compensated for the reduction of flight operations in adverse weather, and also for reducing aircraft losses from the action of air defense forces. Bombardment was generally area and uncorrected. In some isolated cases, fire was corrected by aircraft (or helicopter) spotters or by reconnaissance groups landed from submarines or helicopters. Foreign defense specialists have equated NEW JERSEY's main battery to the firepower of bombing strikes of 50 fighter-bombers. Over a six-month period, NEW JERSEY carried out 434 fire strikes from her 406- and 127-mm caliber guns.

The U.S. Navy, assessing the actions of the battleships in Vietnam, has remarked that their ability to operate, in practically any weather conditions, the high accuracy and effectiveness of their fire in destroying defended targets, placed the BB in first place compared with field artillery, bombers, and strike aircraft. After the dirty war in Vietnam, NEW JERSEY was once again mothballed.

In 1981, Congress, within the framework of the regular program of force improvement, authorized allocation of resources for demothballing and modernizing NEW JERSEY, fully approving the Navy's proposal for subsequent recommissioning of the remaining three battleships. A foundation for taking such a decision was the lying, provocative ceartifications of the "growing threat of the USSR Navy." It was also underscored in the foreign press that for these relatively modest expenditures, BBs could effectively be employed in forward groups to supplement the aircraft carrier groups.

In 1980, the U.S. Navy defined the primary missions of the battleships. They were to be employed both within the composition of aircraft carrier battle

groups, and as the nucleus of independent surface action groups. It is considered also that they could successfully operate, while executing fire support missions for landing forces, for the defense of sea lines of communications and achieve sea superiority in dispersed regions of the maritime TVDs. It is noted also that the installation of the TOMAHAWK guided missile permits the use of these ships to conduct strikes against second echelon and reserve ground forces. In peacetime, BBs can actively be employed as a show of force in the so-called regions "of vital importance" to the U.S.

There are presently three battleships -- NEW JERSEY (BB-62), IOWA (BB-61) and MISSOURI (BB-63) -- in the fleet following completion of the first phase of modernization; and WISCONSIN (BB-64) is expected to return to the active fleet by 1988. These BBs, completing the first stage of modernization, are equipped with the following weapon systems: eight 4-cell armored TOMAHAWK launch systems, four 4-cell armored launch installations for the antiship missile HARPOON, three 406-mm 3-barrel and six 127-mm twin-barrel turrets, four 20-mm anti-aircraft guns (VULCAN-PHALANX close-in weapon system) and three SEA SPRITE (SH-2F) ASW helicopters. In addition, new radar systems, communications, fire control and electronic warfare systems are installed.

Battleships can have any of three modifications of the TOMAHAWK. For destruction of shore targets there are the BGM-109A with a nuclear warhead and a range of 2,500 km and the BGM-109C with a conventional warhead. To attack surface ships, there is the BGM-109B with a high-explosive fragmentation war head of 454 kg (up to 550 km range).

The BGM-109A/C use a combined guidance system consisting of a basic inertial navigation system with a radio altimeter, into which are fed corrections from the TERCOM correlation system. The foreign press has noted that the arrival accuracy of the missile on target does not depend on the length of flight, since the TERCOM compensates for errors of the inertial system which increase over time. The BGM-109B anti-ship TOMAHAWK is guided, as well, toward its surface target using a combination system, consisting of an inertial system with a radio altimeter (initial and mid-course phases of the trajectory) and active radar seeker head with an IFF interrogator (on final). The missile speed is 885 kM/HR.

The RGM-84A HARPOON anti-ship missile has a 110-130 km range, and its guidance system does not differ in principle from that used by the BGM-109B. The warhead is high explosive and weighs 225 kg. Its cruising speed is Mach 0.8.

The range of the ships' main battery guns (406-mm) is 39 km, the rounds weigh 860-1,225 kg and the firing rate for each barrel is 2 rds/min.; the 127-mm gun range is 16.5 km, one of its rounds weights 25 kg and the nominal firing rate of the turret is 15 rds/min. The VULCAN-PHALANX AA 20-mm close-in weapon system is designed to destroy diving and high speed, low-flying airborne targets. Its maximum horizontal range is 6 km; it can reach up to 2,500 m in altitude; nominal rate-of-fire for the 6-barrel complex is 3,000 rds/min with a ready service supply of 950 rounds.

Heavy-armored protection guarantees the high survivability of the battleship: the side armor thickness is 406-482 mm; the upper deck, 102 mm; the main deck,

152 mm; combat center has 440 mm of armor; the side armor on the main battery turrets is 432 mm thick, its rear walls, 305 mm, and the thickness of the roof armor is 184 mm.

The U.S. Navy has reviewed a number of variants of the Phase II modernization of the battleships. One of them proposed removal of the stern main battery turret, all or part of the 127-mm guns, as well as the missile box launchers. In their place, it was planned to install a hangar and flight deck about 100 m long, and to emplace a single vertical launch missile system. In this case, the ship could then take on board 12 VSTOL aircraft or as many helicopters.

Recently, the foreign press has reported on a U.S. design for a shipboard variant of a mass volley fire reaction system (PC30), or ABRS (Assault Ballistic Rocket System), based on the Army's MLRS system, designed for installation on a number of surface ships, including IOWA-Class battleships. Specifically, they are examining the feasibility of replacing four 127-mm gun turrets with PC30 ABRS box launchers. These will fire rockets out to 30 km, and in the future, will extend the range to 90 km. U.S. defense experts consider that the ABRS is the most effective means of destroying kinetic energy generators, armored combat vehicles, artillery batteries, antiair defense systems, $C^3$ systems, and other important targets.

It is planned to modernize the gun weapons because there are new rounds for the 406-mm and 127-mm guns, which, in U.S. defense specialists' opinion, will increase their range and the accuracy of target destruction as well as reduce the expenditure of ammunition. Thus, the 127-mm guided round with a laser self-guidance, equipped with jet engines, allows a range increase up to 40 km, while the 406-mm range can be extended to 80 km.

Foreign defense specialists consider that after modernization, BBs could accomplish a wide circle of missions during combat action at sea. They are capable of conducting strikes with guided missiles with both nuclear and conventional warheads against shore installation and maritime targets, and carry out artillery action against surface ships and shore installations as well. The importance of this is the fact that the BB possesses great survivability (405 times greater than the aircraft carrier).

In recent years, the tactics of employing battleships as part of carrier battle groups and in surface action groups has been exercised. In both instances, they have worked out a tight combat coordination with the forces and system of the zonal network of anti-air and antisubmarine defense in a TVD. In so doing, they pay special attention to working out joint strikes by shipboard missiles and deck aircraft against maritime and shore targets as well as to the organization of all the aspects of defense. It is considered that BBs have become capable of carrying out at least part of the combat missions earlier assigned only to aircraft carriers and their strike aircraft.

In the makeup of a carrier battle group, the combination of the battleship's guided missiles with conventional or nuclear warheads and its main battery guns with the carrier's strike aircraft, demonstrates considerable striking power in actions against surface groups as well as enemy shore installations

in support of Marine amphibious operations and their follow-on shore combat action.

The carrier battle group battle formation (1-2 CVs and 1 BB) envisions the movement of the BB with screening ships in the direction of the enemy [along the threat axis] at distances of 300-500 km from the carrier for the purposes of carrying out simultaneous missile and strike aircraft attacks on the enemy surface strike groups 800-1,000 km from the carrier. In order to increase the probability of success in anti-air and antisubmarine warfare, U.S. specialists are considering the possibility of including in the composition of the carrier battle group one carrier equipped only with fighters and antisubmamrine warfare aircraft.

Exercise experience of the last few years (1984-85), underscores such a tactic for employment of the battleship. In these exercises, while conducting combat operations against "enemy" surface forces, simultaneous as well as sequential strikes with TOMAHAWK and HARPOON and carrier aviation, were practiced. In order to conduct simultaneous strikes, the BB, with its screening ships (four or five surface combatants) moved away from the carrier and toward the "enemy" flank, remaining within air cover of its fighters. Foreign specialists think it is possible to employ, as well, general purpose LOS ANGELES-Class attack submarines, using TOMAHAWK or HARPOON, for these joint strikes. A simultaneous strike with missiles of the battleship and its screen ships (TICONDEROGA-Class CG and SPRUANCE-Class DDs), fighter-bomber carrier aircraft (16-20 planes) and nuclear submarines, in foreign specialists' estimate, is simply too hard to repulse.

The battleship is very survivable. World War II experience points out that in order to sink such a large ship as one with 45,000 to 60,000 tons displacement required 8-9 torpedoes or 6-8 500-lb high explosive bombs. For example, the Japanese battleship YAMATO was sunk in April, 1954, after taking hits from 10 U.S. airborne torpedoes (warhead weight of each was about 270 kg) and about 13 250-kg bombs. Recent tests conducted by U.S. specialists have shown that in order to sink a modernized IOWA-Class battleship requires the simultaneous hit of 10 Mk 48 torpedoes, which in their opinion is highly unlikely. The armored protection of the ship makes it practically invulnerable to the antiship missile such as the EXOCET (which can penetrate up to 90 mm of armor).

The inclusion of the battleship, with its great striking power and survivability, into the composition of the carrier battle group substantively increases its strike and defensive capabilities, and guarantees a high level of combat stability while solving the problems of gaining and maintaining superiority in various important military action theaters such as the Norwegian and Mediterranean Seas, North Atlantic and Indian oceans and other areas, and also in defending its maritime lines of communications and in a range of other cases.

However, the BB can play a major role as the main combat element of an operational missile group. Such a group could consist of a battleship, two TICONDEROGA-Class CGs, four to six SPRUANCE-Class DDs and OLIVER H. PERRY-Class frigates. It can be supported by one LOS ANGELES-Class SSN, land-based patrol aircraft and shorebased fighters when operating within their range. The

operational missile group has substantial strike potential in operations against enemy surface groups and shore installations and sufficiently broad defensive capabilities. The collection and processing of information on the enemy as well as guaranteeing over-the-horizon targeting is accomplished by the OUTLAW SHARK system, based on data from satellite observation and other information sources (aircraft) surface ships and submarines, shore listening posts and centers, etc.)

The group's defensive system is laid out along sector principles with reinforcement along the dangerous axes. A summary composition of the ASW weapons and resources for search might include: 6-8 surface ship sonars, including 3-4 with the TACTAS towed array; 10-14 airborne sonar systems (in helicopters); 40-60 ASW guided missiles ASROC; and 35-40 tubes of ASW torpedoes.

In the most active ASW defensive zone (about 50-80 miles from the BB) search is carried out by ships with the TACTAS antenna and shipborne ASW helicopters. Beyond this zone (150-200 miles), regional theater ASW aircraft operate. And in the far zone, ASW defense is carried out by the LOS ANGELES-Class SSN. All these forces and resources, in foreign defense specialists' views, can assure detection, prosecution and destruction of up to 3-4 enemy submarines.

Air defense of the battleship is the responsibility of the air defense screen ships (AEGIS, TARTAR and SEA SPARROW systems and the VULCAN-PHALANX, 76-mm and 127-mm guns), sea and landbased fighters (in the event the missile group is operating within their zone of accessibility). As a rule, fighters operate at distances of 300 to 400 miles. The missile groups antiair defense systems, in foreign specialists' estimate, are capable of killing no less than 12 to 14 anti-ship missiles out of each raid of 8 to 12 aircraft.

U.S. military specialists, pointing to the need to strengthen fire support for amphibious assault operations, underscore that the best solution to this problem is the battleship. In the view of the U.S. Navy, battleships at the outset of the landing operation can lay down cruise missile strikes on the enemy, jointly with carrier air strikes. In order not to disclose, at the start, the participants of the landing, strikes are carried out along a wide front against ships at sea, bases, airports, important air defense system installations, command points, communications networks, missile and artillery units and also ground force groupings. Later, battleships will participate in preliminary fire preparation before the landing, which begins from one to five days before. In this period, missile strikes against shore installations are combined with carrier strike aircraft attacks as well as Marine aircraft to suppress antiair defense systems, which allows in the latter periods for the battleships to approach the shore and utilize its shipboard artillery.

In the period of fire preparation for the landing and supporting the landing forces on the beach, destruction by artillery of main targets is carried out as announced by the commander of the landing force. In one hour the ship can discharge from its nine barrels more than 1,000 rounds. In so doing, the area of maneuver for firing can be dispersed from 20-30 km from the shore. When using active-reactive rounds, this distance can be increased up to 50-60

miles. Destruction of targets can be done either by volley fire or single shot.

U.S. Navy specialists consider that the combat capabilities of battleships will considerably increase the strike power of operational navy groups, which are one of the main instruments of carrying out the aggressive foreign policies of the White House.



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SONAR SYSTEMS FOR SEARCH/DESTRUCTION OF MINES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 62-66

[Article by Capt 1st Rank, Ret. A. Prostakov; "Sonar Systems for Search and Destruction of Mines"]

[Text] In preparing for "mine warfare," actively being pursued by the U.S. Navy and other countries of the aggressive NATO bloc, much attention is being paid, not only to modernizing mines, but also to developing countermeasures, particularly by developing specialized sonar technology, enabling effective search and classification of bottom and moored mines.

Foreign navies have widely used specialized sonars for mine hunting for some time now. However, as emphasized in the foreign press, exceptional success in their development has been attained recently. Effective and sufficiently useful systems have been created which are integrated with other combat systems in mine force ships, and the means of classification of detected mine-like objects have been improved.

A mine search, especially for bottom mines, with sonar, is unfailingly accompanied by a large number of false alarms, caused by reflection of the radiated sound beam off irregularities and the non-uniformity of the sea floor, rocks, sunken objects, large fish, etc. In order to shorten the time needed to analyze contacts and increase the confidence of detected object classification, special measures are taken. The Western press points out two basic principles of signal classification from mine-like objects, either analysis of the echo signal or analysis of the shape/form of the acoustic shadow on the indicator screen.

Classification by returning echo was, for a long time, the primary method, but, as accumulating evidence shows, it is not effective enough. It requires a high acoustic signal contrast, reflected off small-size objects--mines, seen against a background of continuously strong reflections off the sea bottom, which in a number of cases, fully mask any usable signal. The use of protective cover and other methods of reducing acoustic signature makes the problem of mine detection and classification even more difficult. Significant variations in the parameters of the returning echo, not taking in account the

strong influence of environmental conditions, limit the capability of comparing the signal with existing standard signals.

Classification by displaying the acoustic signal, which became possible with the advent of minehunting sidelooking sonars, is considered quicker, simpler and more successful. The reason for this lies in the geometry and continuity of the shadow form and reception of strong contrast between the shadow reflected on the screen and the surounding background, as well as in the independence of the shadow contrast from the reflected characterisitics of mines. These properties have made this means of classification by acoustic shadow display the basic means in the above noted state-of-the-art sonars.

The AN/SQQ-30 SONAR is installed in the minehunter, USS AVENGER (the lead ship in a class of 14 under construction, entering service in 1985), and, according to Western specialists, is considerably more effective than its predecessor, the AN/SQQ-14 (installed in AGGRESSIVE-Class minesweepers which entered the fleet between 1954 and 1956). The sonar has tracks for search and classification with separate acoustic transducers, installed in a special, towed, egg-shaped apparatus 1.07 m wide, which is released through a special shaft in the ship's hull near the keel on the starboard side. Search speed is between 3 and 5 kts.

Transducers for both tracks are set in the device one over the other. The search transducer provides a constant omnidirectional view in the horizontal plane and the classification transducer can be rotated in the direction of a target being tracked.

The cable is wound on a reel about 3 m in diameter, located in the minesweeper's bow.

The main electronics for the system is combined in two consoles--search and classification. Both use the standard AN/UYK-21 display. Automatic signal detection, processing and system control is done by two standard AN/UYK-44 computers. During continuous search with parallel classification of observed mine-type objects, both consoles operate independently, each served by its own operator.

The display screen for the search track is divided into three sectors. Two on the right serve as indicators of information (in the system, the coordinates "course-range"), received from the two viewing sectors. It displays, in alpha-numeric format, information processed by the computer, defining the situation and system operating mode. The third (left) sector displays four horizontal scan lines, one over the other, on which are displayed, with a high degree of resolution, sequential data points received from the detected target. The target whose signals appear on this screen is selected by the operator or the computer.

Starting in 1986, it is planned to install the AN/SQQ-32 sonar in the AVENGER-Class minesweepers (starting with the second ship), which it is assumed will be able to conduct a more effective search at a higher towing speed.

U.S. helicopter-minesweepers are equipped with the AN/AQS-14 sonar system whose transducer has multi-lobe characteristics of directionality, range gates at all ranges within the boundaries of observable zones, and provides search capability according to side scan principles. The transducer is installed in the lower half of the submerged towed device. The device, or sled, is stabilized in course, and is capable of maintaining a given depth off the bottom or the sea surface by means of respective pingers and horizontal rudders. The builders also foresaw the need for protection against accidental collision with the bottom and against broaching. A special installation in the sled permits, on command of an operator, the ejection of marker buoys, identifying the location, subject to further thorough inspection. The information from the transducer to the equipment on board the helicopter is received through a small diameter coaxial cable.

The operator observes the situation on two TV screens, on which is continuously displayed all necessary information about the target, own motion, etc. The operator can record on video tape the presentation on the screen.

According to foreign experts, the AN/AQS-14 sonar has excellent capabilities as follows: a high search potential, ease of use, and simplicity and speed of setting up the equipment on board the helicopter. It is presumed that this could be used on ships with dynamic support principles, for example, air cushion vessels.

The 193M minehunting sonar (produced in 1976 and installed in minehunters of the UK and German navies) has been modernized several times. It also has search and target classification tracks. When in the search mode, which is conducted at a ship speed of up to 12 kts, it uses side scan sonar. A special rapid signal processing block filters out deficiencies, common to normal side scan and permits passage of separate presentations of data points from the target while in overlapping scan zones, by means of sequential dispatches, etc. According to the foreign press, this system assures successful detection of bottom objects with diameters larger than 0.46 m and 1.53 m long at a range of 550 m from the ship. When targets are detected close in (up to 180 m), the sonar automatically begins target classification.

Information on all detected objects is displayed on the search control panel screen in Mode A (with linear scan in range and signal amplitude, which changes, depending upon the range) and Mode B (in the system of azimuth and range coordinates), and is input to the computer's NTDS, where it is stored in memory.

During contact classification, current information on bearing and range is received from the computer memory on the object being classified as well as other data. The operator can save, on the screen, information necessary for classification during the period needed for classification. While the ship observes the object, tentatively classified as a mine, signals are accumulated in the computer memory from illumination of the object from various angles. Four such signals, allowing an evaluation of the target, can be simultaneously drawn from the computer and displayed on the screen one after the other. Western specialists consider that this substantially enhances the credibility of the classification.

Acoustic transducers for both tracks are separate and located in an under-the-keel fairing.

In British minehunters, the 193M sonar system is linked with a combat information system CAAIS, which assures accurate navigation, reflection of the tactical situation during the search and destroy operation, etc. The system, which has its own computer, compass, DECCA radio navigation system and navigational radar, allows the ship's position to be determined within 25 m. In the search mode, the computer processes navigational data and sends out a course signal to the autopilot which keeps the minesweeper on its assigned course. Exchange of information between the sonar and the computer proceeds automatically through an interface, without distracting the operator from his constant, necessary work. The officer directing the anti-mine operations, conducts the inspection on his own display and follows the general tactical situation and information being received. When a mine-like object is detected, the operator-acoustician hits a button, transmitting data to the computer, which works out the coordinates and target symbology and transmits them to the officer's display. Keeping track of the mine, while destroying it, and keeping the minesweeper in a safety zone, while simultaneously mintaining constant contact with the mine, is accomplished by means of a special separate CIC display.

With the aid of a perforator, linked to the computer output, current information and reports can be converted to perforated tape for subsequent analysis and continuing work, or for automatic transmission via radio link to other ships or ashore.

The DUBM-21A SONAR is installed in minehunters of France, the Netherlands, Belgium, and several other countries. Its separate transducer tracks for search and classification, housed in an under-the-keel fairing, assure operations for $270^0$ relative to the ship's course. Search frequency is 100 kHz, frequency modulated in a +/-10 kHz band, pulse length 0.2 or 0.5 microseconds. The display screen for the search track (range scales of 400, 600 or 900 m) shows information received from a $30^0$-wide sector, and illuminated range marks every 100 m. Detected targets are designated by luminescent circles, a classified target by a square. During review of the surrounding area through transducer rotation, the lighted sector is rotated relative to the center of the screen. The screen also displays the ships heading, gyro angle and bearing of the search sector, azimuths and range to the target and other necessary information.

The classification track operates at a frequency of 420 kHz, +/-15 kHz. On a square display screen, with range scales of 200 and 300 m, there are tickmarks to the target in the form of short, horizontal lighted lines, range marks every 50 m, and other important information. The memory enables one to save the displayed images of up to 15 mines and present them over again on a TV-type screen.

Today, French minesweepers are equipped with a NEW TSM-2022 SONAR, which differs from its predecessor in reduced weight and size (by 30-40 per cent). All electronics are concentrated in one control panel. Search and classification tracks are served by a compact acoustic transducer, whose

weight together with its lifting and swivel device is 900 kg. The small-sized transducer is located in the minesweeper bottom in a trunk 70-cm in diameter.

Tha array has an oblong rectangular shape and can be rotated in the horizontal and vertical planes and retracted inside the hull. In the horizontal position, the array has a directivity characteristic, in the horizontal plane, in the search mode, of 14 or $28^0$, and in the classification mode, $7^0$. In the vertical plane, both modes are $15^0$.

The sonar can detect bottom mines up to depths of 120 m with the ship's speed around 10 kts; however, during search operations, speed does not normally exceed 4 kts. The location of a mine relative to the ship can be pinpointed within 1 m.

Ten echo signals received consecutively from a target can be input to the memory unit and, during the classification process, output to a display with an automatic reversal of the final signals according to the order of their receipt. These minehunting sonars, under consideration, as opposed to others, classify targets with intermittent observation of the water medium. However, specialists point out that breaking up the continuity of observations for short periods does not cause additional problems.

When the transducer is rotating in the vertical plane, the sonar can define deep anchored mines. It can also employ a side scan acoustic illuminator as an echogram to pick up bottom relief when supporting mine warfare missions.

The TSM 2022 sonar is part of the integrated IBIS-V anti-mine system, which interconnects various resources: navigational radar, satellite navigational systems, pulse doppler systems and others. The entire situation, information concerning which arrives from various sources, is displayed on the TSM 2060, 4-color screen. The screen can display in color up to 256 contacts simultaneously, map contours, the navigational situation, search maneuvers, etc. In the event a mine is detected, the screen will display a "danger circle" (covering a 100 m radius with the mine in the center). The entire picture can be written and instantly reproduced on magnetic tape cassettes. The PAP 104 is in the IBIS-V system for mine destruction.

Sonar technology finds other applications in mine warfare. In the early 1980s, Germany and Sweden developed special explosives for acoustic demolition of objects designated by the PAP 104 for destruction. These explosives are activated by a coded acoustic signal at ranges out to 600 m. Before such explosive devices were developed, charges were exploded by a signal from a grenade thrown over the minesweeper's side. However, when sweeping in a group, the charge could go off prematurely by signal activity from another ship or from the explosion from another charge. Therefore, these explosive charges, activated only by an individually coded signal, actually increases the minesweeper's safety.

The underwater device, PAP 104, Mk4, pops up before the explosion due to separation of the pontoons, which serve as ballast. For quickly detecting the guidrope and hoisting it for repeated use, a marker buoy is employed.

Sonar equipment is used in test ranges for rapid, successful and inexpensive control of minehunting sonar parameters, as well as in trainers used for exercising and preparing personnel.



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NEW U.S. MARINE CORPS HELICOPTER

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 86 (Signed to press 9 Dec 86) p 66

[Article by Col I. Karenin; "New U.S. Marine Corps Helicopter"]

[Text] Deliveries have begun to units of the U.S. Marine Corps of the new AH-1W SUPER COBRA fire support helicopter, which is an improved version of the AH-1T SEA COBRA, currently in service with a similar designation. As opposed to the previous SUPER COBRA, judging by foreign press information, it is equipped with the more powerful General Electric T700-GE-401 turboshaft engines and capable of carrying diverse weapons, including the HELLFIRE anti-tank missiles with a laser designation system.

In characterizing the T700-GE-401 engines, the foreign press notes that they permit exceeding the AH-1W power plant by nearly 65 per cent, have low specific fuel consumption, high reliability, and are little effected by the corrosive action of sea water. And this fact, that several other U.S. Navy helicopters are also equipped with these engines, will, in the future, assist in solving problems of material-technical support for new helicopters.

Onboard weapon suite includes: three-barrel M197 20-mm cannon (rate of fire, 675 rds/min) mounted in a nose turret; TOW or HELLFIRE anti-tank missile (four missiles on each side); two AIM-9L air-to-air SIDEWINDER guided missiles, and in subsequent models, the STINGRAY or the anti-radiation SIDEARM; unguided rockets (NAR) and pod-type cannons. Thus, while executing a fire support mission for a landing, the helicopter can carry 76 70-mm NAR, 16 127-mm ZUNI rockets or 2 GPU-2A gun pods with 20-mm cannon.

According to foreign press information, the Marine Corps command is expected to purchase 44 AH-1W SUPER COBRA and, in the future, to modify all AH-1T SEA COBRA helicopters



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FIGHTING STRENGTH OF NATO COUNTRIES' NAVIES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 67-72

[Article by Capt 1st Rank V. Afanasyev, Capt 2nd Rank Yu. Krabchenko; "Fighting Strength of NATO Countries' Navies"]

[Text] The North Atlantic Union's military-political leadership, while inflating the false thesis concerning the "growing Soviet military threat," is building up the power of its armed forces, preparing them for unleashing an aggressive war against the USSR and the other countries of the Socialist community. Significant attention to these military preparations by the maintenance of high combat readiness of the naval forces, equipping them with state-of-the-art weapon systems, working out cooperation of the member countries' national naval forces.

The U.S. has the most modern and largest navy. In accordance with a long-term program, it is planned to bring the total number of combatants up to 600 units by the beginning of the 90s. OHIO-Class nuclear missile submarines with the TRIDENT system, multi-purpose LOS ANGELES-Class submarines, TICONDEROGA-Class guided missile cruisers are being commissioned at an accelerated rate, the ship strength of the amphibious forces is being brought up to date, and the naval aviation inventory is being significantly improved. Combatants and submarines are being armed with TOMAHAWK cruise missiles. NATO European countries are keeping up with their oceanic partner. Great Britain has begun to realizing a program of rearming its sea-based nuclear missile forces. In April 1986, the SSBN VANGUARD was ordered. It is the lead ship of four scheduled to be built. They will carry the TRIDENT-2 missile with a range of 11,000 km. France also is planning, starting in 1988, to build a new class SSBN, equipped with missiles with a range of up to 6,000 km. Much significance in the navies of these countries is being given to improving the combat capabilities of the fleet's escort and minesweeping forces.

As a result of the actions which have been taken, changes have occured in the number of combatants and naval aviation inventory in the NATO countries and their organizational structure. In the accompanying tables below, compiled on the basis of material in the open foreign press, the numbers and fighting strength of NATO navies is shown as of 1 January 1987 (a total of about 3,000 combatants, craft and auxiliary ships, more than 2,000 combat aricraft and

approximately 1,200 helicopters). U.S. Naval Reserve aviation, which numbers about 700 combat aircraft and helicopters is a fairly significant force.

Table 1

PERSONNEL STRENGTH OF NATO NAVIES

| Country | Fleet | Naval Aviation | Marines, including Marine Aviation (Coastal Artillery) | Total in Navy |
|---|---|---|---|---|
| U.S. | 505,800 | 68,000 | 196,200 | 770,000 |
| Great Britain | 58,800 | 4,000 | 7,700 | 70,500 |
| FRG | 31,800 | 6,700 | -- | 38,500 |
| France | 57,700 | 9,300 | 1,000 | 68,000 |
| Italy | 42,250 | 1,500 | 750 | 44,500 |
| Canada | 14,500 | -- | -- | 14,500 |
| Belgium | 3,700 | -- | 800 | 4,500 |
| The Netherlands | 12,500 | 1,700 | 2,800 | 17,000 |
| Norway | 6,600 | -- | (1,000) | 7,600 |
| Denmark | 5,200 | -- | (500) | 5,700 |
| Greece | 19,000 | 500 | 2,500 (from ground forces) | 19,500 |
| Turkey | 43,000 | 1,000 | 5,000 | 49,000 |
| Spain | 39,300 | 1,000 | 12,200 | 52,500 |
| Portugal | 11,400 | -- | 2,600 | 14,000 |

Table 2

U.S. NAVY SHIP STRENGTH

| Ship Class (Usual Letter Designation) | In Commission | Being Built and Placed on Order (Being Modernized and Reequipped) | In Special Reserve (in mothballs) |
|---|---|---|---|
| SUBMARINES | | | |
| Nuclear Missile (SSBN)..... | 38 | 5 | -- |
| Nuclear Attack (SSN)..... | 97 | 17 | (3) |
| Diesel (SS)..... | 4 | -- | -- |
| Total..... | 139 | 22 | (3) |
| MAJOR COMBATANTS | | | |
| Nuclear Aircraft Carriers (CVN) | 5 | 2 | -- |
| Aircraft Carriers (CV, CVA).... | 9 | (1) | (2) |
| ASW Carriers (CVS)..... | - | - | (2) |
| Battleships (BB)..... | 3 | (1) | -- |
| Nuclear G-M Cruisers (CGN)..... | 9 | - | -- |
| Guided-Missile Cruisers (CG)... | 24 | 14 | -- |
| Cruisers (CA)..... | -- | -- | (2) |

| Ship Class (Usual Letter Designation) | In Commission | Being Built and Placed on Order (Being Modernized and Reequipped) | In Special Reserve (in mothballs) |
|---|---|---|---|
| Guided-Missile Destroyers (DDG) | 37 | 1 | (3) |
| Destroyers (DD)..... | 31 | -- | 1 (10) |
| Guided-Missile Frigates..... | 46 | 2 | 9 |
| Frigates..... | 51 | -- | 8 |
| Patrol Missile Boats (PHM)..... | 6 | -- | -- |
| Total..... | 221 | 19(2) | 18(19) |
| MINESWEEPERS | | | |
| (MSH, MCM) (MSO) | | | |
| Total | 5(sic) | 15 | -- |
| AMPHIBIOUS SHIPPING | | | |
| Command Ship (LCC)..... | 2 | -- | -- |
| Multipurpose Assault (LHA, LHD) Assault Ship (LHP)..... | 5 | 2 | |
| Landing Ship Dock (LSD)..... | 10 | 6 | (5) |
| Transport Dock Ship (LPD)..... | 13 | -- | |
| Landing Ship Tank (LST)..... | 18 | -- | 2(3) |
| Cargo Ships (LKA)..... | 5 | -- | -- |
| Total..... | 60 | 8 | 2(8) |
| Command Ship (AGF) | 2 | -- | -- |
| TRAINING AIRCRAFT CARRIERS (CVT) | 1 | -- | -- |
| AUXILIARIES | | | |
| Mobile Service Force Ships (AE, AFS, AO, AOE, AOR, AD, AR, AS). | 63 | -- | (3) |
| Service Ships (ARS, ASR, ATA, ATF, ATS)..... | 15 | -- | 4(9) |
| Other Auxiliaries 9AG, AGDS, AH, AP, APL, AVM) | 3 | -- | (8) |
| Total..... | 81 | -- | 4(20) |
| MILITARY SEALIFT COMMAND | 64 | 18(2) | (23) |
| Total..... | 570 | 82(4) | 42(73) |

Table 3

## NAVAL SHIP STRENGTH OF EUROPEAN NATO COUNTRIES AND CANADA

| SHIP CLASS | Great Britain | FRG | France | Italy | Canada | Belgium | The Netherlands | Norway | Denmark | Greece | Turkey | Spain | Portugal | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| SUBMARINES | | | | | | | | | | | | | | |
| Nuclear Missile | 4 (1) [1] | — | 6 | — | — | — | — | — | — | — | — | — | — | 10 (1) |
| Nuclear Attack | 15 (3) | — | 3 (3) | — | — | — | — | — | — | — | — | — | — | 18 (6) |
| Diesel | 15 (4) | 24 | 15 | 9 (2) | 3 | — | 5 (4) | 14 (6) | 4 | 10 | 16 (1) | 8 | 3 | 126 (17) |
| MAJOR COMBATANT CLASSES | | | | | | | | | | | | | | |
| Aircraft Carriers | 3 | — | 2 (1) [4] | 1 | — | — | — | — | — | — | — | 1 (1) | — | 7 (2) |
| Guided Missile Cruisers | — | — | 1 | 2 | — | — | — | — | — | — | — | — | — | 3 |
| Cruiser-Helicopter Carriers | — | — | 1 [5] | 1 | — | — | — | — | — | — | — | — | — | 2 |
| Guided Missile Destroyers | 14 [2] | 7 | 14 (6) | 4 (2) | (6) | — | — | — | — | — | 2 | — | — | 41 (14) |
| Destroyers | — | — | 3 | — | 4 | — | — | — | — | 14 | 12 | 10 | — | 43 |
| Guided Missile Frigates | 26 (8) | 6 (2) | 24 | 12 | — | 4 | 16 [7] (4) | 5 | 5 | 2 | (4) | 12 [9] (3) | (2) | 112 (23) |
| Frigates | 12 | 3 | 1 | 4 | 16 | — | — | — | 5 | 5 | 4 | — | 17 | 67 |
| Corvettes and Patrol Boats | 18 | 6 | 10 | 8 (4) | — | — | — | 15 | — | — | — | 9 [10] | — | 66 (4) |
| COMBATANT SMALL CRAFT | | | | | | | | | | | | | | |
| Missile | — | 10 | 3 | 7 [8] | — | — | — | 39 | 10 | 16 | 14 | — | — | 129 |
| Torpedo | — | — | — | — | — | — | — | 8 | 6 | 6 | 11 | — | — | 31 |
| Patrol (Guard Boats) | 7 | — | 5 | — | — | — | 3 | 3 | 29 (1) | 9 | 30 [9] | 30 [11] | 18 | 134 (1) |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MINESWEEPERS | | | | | | | | | | | | | | |
| Minehunters | 25 (4) | 12 | 21 (4) | 3 | — | 10 (8) | 11 (4) | 1 | — | — | 7 | — | — | 100 (20) |
| Ocean Minesweepers | 10 (2) | — | — | 4 | — | — | — | — | — | — | — | 4 | — | 18 (2) |
| Coastal Minesweepers | 11 | 27 | 5 | 11 | — | 5 | 12 | 9 | 6 | 14 | 22 | 8 | 4 | 134 |
| Harbor Minesweepers | — | 18 | — | — | — | 14 | — | — | — | — | 4 | — | — | 36 |
| Mine Layers | 1 | 2 | — | — | — | — | — | 3 | 7 | 2 | 7 | — | — | 22 |
| AMPHIBIOUS SHIPS | | | | | | | | | | | | | | |
| Landing Ship Tank-Dock, Landing Ship Dock, Transport | 10 (1) | — | 8 (3) | 2 (2) | — | — | — | — | — | 13 | 7 | 6 | 1 | 47 (6) |
| Small Craft | — | 20 [3] | 9 (2) | — | — | — | — | 7 | — | — | 34 (3) | 3 | 2 | 75 (5) |
| Total | 171 (23) | 165 (2) | 131 (19) | 78 (10) | 23 (6) | 33 (8) | 47 (12) | 104 (6) | 72 (1) | 90 | 170 (8) | 91 (4) | 45 (2) | 1221 (101) |
| Auxiliary Ships and Boats | 227 | 132 | 213 | 139 | 50 | 14 | 35 | 29 | 27 | 38 | 109 | 141 | 12 | 1166 |
| Total | 398 (23) | 297 (2) | 344 (19) | 217 (10) | 73 (6) | 47 (8) | 82 (12) | 133 (6) | 99 (1) | 129 | 279 (8) | 232 (4) | 57 (2) | 2387 (101) |

1. The number of ships being built and also those being built for which orders have been placed are shown in brackets (here and later).
2. Of these, 2 (D23 BRISTOL and D20 FAYFE) have a full displacement of 6,200-7,100 tons, some foreign sources refer to them as light cruisers.
3. Here and later in the building plans, are ships with 400-1,000 tons displacement.
4. Nuclear powered aircraft carrier PAN-1 RICHELIEU.
5. Cruiser-helicopter carrier R-97 JEANNE d'ARC, also called assault landing ship.
6. Air cushion vehicle.
7. Includes 2 TROMP-Class ships with 4,308 tons full displacement. In the foreign press they are also called guided missile destroyers.
8. Of these, 23 have ASW weapons.
9. Of these, there are 5 BALEARIS-Class ships with 4,177 tons full displacement. Some foreign specialists refer to this class as guided missile destroyers.
10. Includes 4 ATRAVIDA-Class ships, redesignated from frigates.
11. Includes 12 boats (6 LASAGA- and 6 BARCELONA-Class)adapted for anti-ship missiles.

Table 4

COMBAT STRENGTH OF NATO COUNTRIES' NAVAL AVIATION

| Aircraft Type | Number of Squadrons (Fixed Wing and Helos in them) | Including |
|---|---|---|
| 1 | 2 | 3 |
| | U.S. (Regular Forces)(1) | |
| Fixed Wing | 155(1,697) | |
| Helicopters | 52(762) | |
| CARRIER-BASED AVIATION | | |
| Fixed Wing | 100(1,025) | |
| Helicopters | 25(286) | |
| Strike Aircraft | 33(370) | 13 (130 A-6E INTRUDER), 20 (240 A-7E CORSAIR) |
| Fighter-Ground Attack | 10(120) | 10 (120 F/A-18 HORNET) |
| Fighters | 22(264) | 22 (264 F-14A TOMCAT |
| ASW | | |
| Fixed Wing | 11(110) | 11 (110 S-3A/B VIKING |
| Helicopters | 23(264) | 13 (102 SH-3D/H SEA KING), 6 (103) SH2F SEA SPRITE), 4 (59 SH-60B SEA HAWK) |
| Reconnaissance (DRLO, EW, Airborne Recce) | 24(161) | 13 (52 E-2C HAWKEYE), 11 (58 EA-6B PROWLER, 21 EA-3B SKYWARRIOR), 30 RF-14A TOMCAT |
| Helicopter-Minesweepers | 2(22) | 2 (22 RH53D SEA STALLION and MH-53E SUPER STALLION) |
| LAND-BASED AIRCRAFT | | |
| Fixed Wing | 26(250) | |
| Land-Based Patrol | 24(476) | 24 (216 P-3B ORION) |
| EW Reconnaissance | 2(34) | 2 (22 EA-3B SKYWARRIOR, 12 EP-3E ORION |

| 1 | 2 | 3 |
|---|---|---|
| MARINE CORPS AVIATION | | |
| Fixed Wing | 29(422) | |
| Helicopters | 27(476) | |
| Ground Attack | 13(206) | 5 (50 A-6E INTRUDER), 4 (76 A-4 SKYHAWK), 2 (40 AV-8B HARRIER-2), 40 AV-8A HARRIER |
| Fighter-Ground attack | 12(144) | 5 (60 F/A-18 HORNET), 7 (84 F-4J/S PHANTOM-2) |
| Reconnaissance (EW, Airborne Recce, Spotter Planes | 4(96) | 1 (15 EA-6B PROWLER), 1 (21 RF-4B PHANTOM), 2 (36 OV-10 BRONCO, 24 UE-1E IROQUOIS) |
| Transport-Landing | 24(372) | 3 (48 CH-53E SUPER STALLION), 6 (96 CH-53A/D SEA STALLION), 12 (180 CH-46F SEA KNIGHT), 3 (48 UH-1N IROQUOIS) |
| Fire Support Helicopters | 3(80) | 3 (58 AH-1T SEA COBRA and 22 AH-1W SUPER COBRA |
| GREAT BRITAIN | | |
| Fixed Wing | 3(23) | |
| Helicopters | 12(169) | |
| Fighter-Ground Attack | 3(23) | 3 (20 SEA HARRIER-FRS.1, 3 SEA HARRIER-T.4 |
| Helicopters | | |
| ASW | 8(123) | 6 (66 SEA KING-HAS.2/5), 1 (35 LYNX-HAS.2/3), 1 (22 WASP-HAS.1) |
| DRLO | 1(9) | 1 (9 SEA KING-AEW.5) |
| Transport-Landing | 2(20) | 2 (20 SEA KING-HC.4) |
| Fire Support | 1(16) | 1 (12 LYNX and 4 GAZELLE)(2) |
| FRG | | |
| Fixed Wing | 8(134) | |
| Helicopters | 2(34) | |

| 1 | 2 | 3 |
|---|---|---|
| Fighter-Bomber | 4(89) | 2 (48 TORNADO), 2 (41 F-104G STAR FIGHTER) |
| Reconnaissance | 2(31) | 1 (26 RF-104G STAR FIGHTER), 1 (5 ATLANTIC) |
| Land-Base Patrol | 2(14) | 2 (14 ATLANTIC) |
| ASW Helicopters | 1(12) | 1 (12 LYNX) |
| Multi-Purpose Helos | 1(22) | 1 (22 SEA KING) |
| | FRANCE | |
| Fixed Wing | 11(98) | |
| Helicopters | 5(47) | |
| Fighter-Ground Attack | 3(36) | 3 (36 SUPER ETANDARD) |
| Fighter | 1(12) | 1 (12 F-8E CRUSADER) |
| Reconnaissance | 1(8) | 1 (8 ETANDART-4R) |
| ASW Fixed Wing | 2(16) | 2 (16 ALIZE |
| ASW Helicopters | 4(35) | 3 (23 LYNX), 1 (12 SUPER FRELON) |
| Transport Landing Helo | 1(12) | 1 (12 SUPER FRELON) |
| Land-Based Patrol | 4(26) | 4 (26 ATLANTIQUE) |
| | ITALY | |
| Land-Based Patrol | 2(15) | 1 (15 ATLANTIQUE) |
| ASW Helicopters | 5(98) | 2 (36 SEA KING), 3 (62 AB.212 ASW) |
| | CANADA | |
| Land-Based Patrol(3) | 4(33) | 3 (18 CP-140 AURORA), 1 (15 CP-121 TRACKER) |
| ASW Helicopters(3) | 2(32) | 2 (32 CH124 SEA KING) |

| 1 | 2 | 3 |
|---|---|---|
| | THE NETHERLANDS | |
| Land-Based Patrol | 2(15) | 2 (13 ATLANTIC) |
| ASW Helicopters | 2(22) | 1 (17 SH-14B/C LYNX), 1 (5 UH-14A LYNX) |
| | NORWAY | |
| Land-Based Patrol(3) | 1(7) | 1 (7 P-3B ORION) |
| Helicopters(3) | 2(16) | 1 (10 SEA KING, 6 LYNX) |
| | DENMARK | |
| Helicopters | 1(14) | 1 (14 SH-3 SEA KING and LYNX) |
| | GREECE | |
| Land-Based Patrol(3) | 1(12) | 1 (12 HU-16B ALBATROSS) |
| ASW Helicopters(3) | 3(22) | 2 (18 AB.212 ASW), 1 (4 ALOUETTE-3) |
| | TURKEY | |
| Land-Based Patrol | 1(18) | 1 (18 S-2E TRACKER) |
| ASW Helicopters | 1(9) | 1 (3 AB.204E and 6 AB.212 ASW) |
| | SPAIN | |
| Fighter-Ground Attack | 1(10) | 1 (8 AV-8S MATADOR, 2 TAV-8S) |
| ASW Helicopters | 3(36) | 1 (14 SEA KNIGHT), 1 (11 AB.212 ASW), 1 (11 HUGHES 500 MD DEFENDER) |
| Fire Support Helos | 1(4) | 1 (4 AH-1G HUEY COBRA) |
| Land-Based Patrol(3) | 1(6) | 1 (6 P-3A ORION) |

1. The normal combat composition of U.S. naval aviation is shown in the table.
2. Part of the 3rd Marine Brigade.
3. Part of the Air Force, but operationally subordinate to the Navy.



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MILITARY-ECONOMIC ASPECTS OF THE 'STAR WARS' PROGRAM

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 73-81

[Article by A. Kireyev; "The Military-Economic Aspects of the "Star Wars" Program"]

[Text] U.S. imperialism's attempt to place the newest achievements of science and technology at the service of great-power imperial pretentions is most clearly manifested in the ambitious program to develop a wide-scale space-based antimissile defense system, known as the "Strategic Defense Initiative" (SDI) or the "Star Wars" program. In refining the advanced scientific-technical plan to weapons of mass destruction, the military-industrial complex, which more and more is seizing upon political and economic levers of power, is counting on achieving strategic military superiority over socialism through a new jump in the arms race, already now in space.

Economic and scientific-technical preparations for carrying out "Star Wars," hitherto unprecedented in scale, are being implemented in the U.S. The American journal, U.S. NEWS AND WORLD REPORT wrote, "prior programs, especially the Manhattan Project to develop the nuclear bomb, and the Apollo Program to land a man on the moon seem insignificant against the background of this undertaking." Let us recall, that the Manhattan Project was implemented over a three year period and cost 10 billion dollars by today's prices; the Apollo Project ran for eight years and cost 100 billion dollars. According to Western military experts' assessments, a long time will be required to implement SDI and the cost for the completely deployed system will exceed 2 trillion dollars.

The draft of the financial budget for SDI (Table 1) was constructed based on these projections. According to Pentagon estimates, from 1984 to 1989 alone, the U.S. must spend approximately 26 billion dollars on "Star Wars," and on the whole, the cost of the first stage of the space militarization program, which will continue until the middle of the 1990s, will be roughly 69 billion dollars. During this time, the SDI budget will remain the Pentagon's largest "research" program.

Table 1

DRAFT OF THE SDI FINANCIAL BUDGET FOR THE 1984-1989 FISCAL YEARS

| SDI Financing | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 |
|---|---|---|---|---|---|---|
| Amount of resources requested, millions of dollars | 992 | 1,777 | 3,790 | 4,989 | 6,260 | 7,405 |
| Size of the yearly increase, per cent | - | 79 | 113 | 32 | 25 | 18 |
| Portion of U.S. DoD expenditures for RDT&E, per cent | 4 | 5 | 10 | 13 | 14 | 16 |

Sensing huge profits, more than 260 American industrial corporations and research organizations, and in turn thousand more teams of subcontractors engaged in this business, responded to the proposals of the organization created in the U.S. to implement SDI (SDIO) to participate in work along specific lines. At the beginning of 1986, SDIO had already issued more than 1,500 contracts, 75 per cent of which went to military-industrial corporations, 20 per cent to government laboratories and 5 per cent to universities.

With the entry of American imperialism on the path towards the militarization of outer space, the already small circle of main military-industrial subcontractors of the U.S. Defense Department, has become narrower. "Space" contracts are being awarded to a dozen corporations closest to the Pentagon, since the technology for the development of "Star Wars" weapons must be kept in strict secrecy, not only from potential U.S. enemies, but also from its allies. According to an AEROSPACE DAILY report, each journalist wishing to have an interview with any worker engaged in an SDI related contract, is obligated to obtain prior approval from SDIO, and all the scientists working on "Star Wars" technology in general are categorically forbidden from speaking on this issue.

Therefore, it is no coincidence, that in 1983-1984, 87.1 per cent of the orders fell to the hands of the ten most "reliable" corporations, six of which are among the list of the Pentagon's 12 largest contractors (Table 2). They have implemented a number of organizational measures in preparation for the production of space armament: vice-presidential positions responsible for implementing SDI have been introduced in the organizational-directorate structure, and special staffs of workers or independent teams have been formed to develop "Star" weapons. Corporate lobbyists are active within government organs, trying to secure the more profitable orders. In the Boeing and Lockheed Corporations, 600 workers are engaged in this activity, and it is planned to increase their number based on the measure of increase in the cost

of the orders. A so-called Strategic Defense Center was created within Rockwell International to lead the operations in 12 SDI areas.

Table 2

PARTICIPATION OF U.S. AERODYNAMIC CORPORATIONS IN IMPLEMENTING SDI

| Corporation Name | Sum of the orders in the 1983 and 1984 fiscal years, millions of dollars | Sum of participation in SDI, per cent |
|---|---|---|
| Boeing | 364.3 | 22.4 |
| Lockheed | 240.2 | 14.7 |
| McDonell Douglas | 236.8 | 14.5 |
| LTV (Ling-Temco-Vought) | 211.0 | 12.9 |
| Teledyne | 115.4 | 7.1 |
| Rockwell International | 88.7 | 5.4 |
| TRW (Thompson-Ramo-Waldridge | 76.3 | 4.7 |
| Hughes | 34.8 | 2.1 |
| AVCO | 30.6 | 1.8 |
| Litton Industries | 25 | 1.5 |
| Total..... | 1,423.4 | 87.1 |

Small military business has not been left out of "Star Wars" contracts. According to SDIO information, approximately 1 per cent of the program appropriations are for this. In 1987 alone, it is planned to award 150 contracts to small companies.

The beginning of the implementation of the "Star Wars" program is not connected directly with Reagan's well-known speech on March, 1983, which merely formalized the military-space RDT&E already occurring and gathered it within the bounds of one strategic program. The theoretical development of the main principles of space armament began a long time prior to their conceptual design. Both the government and private companies had made large appropriations as early as the first post-war years for the prototype development of such weapons.

At the height of the "Cold War," the former fascist general, G. Dornberger, the senior vice-president of the military-industrial corporation of Bell Avianche, led the research in the United States to develop satellites for carrying nuclear weapons which would be able to be placed at any point of the planet on command. At the end of the 1950s, the Pentagon conducted a series of 12 experiments of an antisatellite system, considered by some Western specialists to have been the prototype of the modern ASAT (Antisatellite).

The same concept of the potential for developing space armament systems was born in the Livermore Nuclear Research Laboratory (California). Beginning in 1974, tests of various components of space systems used as charged-particle directed energy weapons have been carried out there. A nuclear explosion, experimentally confirming the theoretical capability of developing a X-ray laser, was carried out under Livermore Laboratory's guidance at a test range in Nevada in 1980.

In counting on profitable future contracts, private companies have invested the resources to develop various components of space weapons even before the official declaration of the "Star Wars" program. As a result, many air defense systems turned out to be very similar in design and technical parameters to antisatellite weapons. Namely, this permitted the American firm Vought to rapidly develop and begin testing the ASAT antisatellite system (the total cost will exceed 4.2 billion dollars) and to be among the first to declare its readiness to participate in SDI, implying that it had already made significant investments in preliminary research. And in general, according to foreign specialists's assessments, each year large firms spend up to 30 million dollars from internal sources on the development of separate systems for the "Star Wars" program.

Thus, it is possible to consider a large part of the appropriations for the development of ABM weapons to be an investment simultaneously in the development of an antisatellite system. U.S. expenditures for military research in the ABM realm in 1954-1983 were more than 15 billion dollars. Since they were first invented, Washington has spent more than 2 billion alone on studying the combat employment possibilities of lasers.

Consequently, the first stage in the development of space weapons, requiring the largest amount of time, had already begun in the U.S. two to three decades ago. However, according to Western specialists' opinions, when taking into account the technologically diverse nature of each of the five main SDI subprogramms (Table 3), it is premature to state, that all of them have gone beyond the fundamental research stage.

The United States has succeeded in achieving the greatest results in the SDI program in the development of specific types of weapons. First, this applies to separate types of combat lasers, the development of which is financed under the "Directed Energy Weapons" clause.

One of the tests of combat lasers occurred in June 1986. As the journal U.S. NEWS AND WORLD REPORT reported, a target "speeding along at a speed of 3,200 feet per second" was intercepted during the test. The U.S. Secretary of

Defense, C. Weinberger, called this experiment the "first fruit of work withing the scope of SDI."

Table 3

DRAFT FINANCIAL BUDGET FOR SDI SUBPROGRAMS FOR FY 1984-1989
(MILLIONS OF DOLLARS)

| SUBPROGRAM | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1985-1989 |
|---|---|---|---|---|---|---|---|
| Resources to detect, lock-on, track and assess target damage..... | 367 | 721 | 1,491 | 1,944 | 2,656 | 3,331 | 10,143 |
| Directed energy weapons..... | 323 | 489 | 1,020 | 1,222 | 1,377 | 1,437 | 5,545 |
| Kinetic weapons... | 196 | 356 | 870 | 1,274 | 1,514 | 1,683 | 5,697 |
| Analysis and combat operations control systems.. | 83 | 99 | 138 | 227 | 260 | 288 | 1,012 |
| RDT&E support..... | 23 | 112 | 271 | 322 | 453 | 666 | 1,824 |
| Total..... | 992 | 1,777 | 3,790 | 4,989 | 6,260 | 7,405 | 24,221 |

It is planned to appropriate the largest sums within the described program for the development of the means to detect, lock-on, track and assess the destruction of targets. Practically all the main "Star Wars" industrial contractors have received contracts in this area. They have been given the task to accelerate the preproduction cycle as fast as possible. The U.S.'s large scientific potential is being mobilized for program research. More than 5,000 highly-qualified scientific workers have been engaged directly in the development of space armament systems. It is being proposed that their number be increased to 19,000 persons by 1987.

Among the government scientific-research organizations working on the development of the SDI program are the national nuclear research laboratories (Los Alamos, Livermore, Sandia, and Hanford), universities and colleges (Harvard, New York University, the University of California, and Massachusetts Institute of Technology), which are working under their aegis have been singled out, and also the research laboratories of the U.S. Armed Forces brances. A specially created directorate of new equipment and technology is leading scientific developments in SDI. It has already distributed orders for research among more than 600 universities and scientific laboratories in the U.S. and Europe.

Military space RDT&E is financed from several sources. The main ones are the U.S. Defense Department, officially engaged in the use of space for military purposes, and the National Aeronautics and Space Administration (NASA), formally responsible for civilian projects, but in fact, especially with the development of the "Shuttle" reusable piloted spacecraft, NASA actively participates in military developments. In 1965, the appropriations for space research along NASA lines exceeded the corresponding Pentagon investments by a factor of 3.3, and in 1980, only by a factor of 1.2, but in 1982, the Defense Department outstripped NASA in the volume of resources allocated for these purposes for the first time: the Pentagon appropriated 5.9 billions dollars, but NASA appropriated 5.6 billion dollars during this same time.

Fragmentary reports are appearing in the foreign press concerning the specialization areas of the individual research organizations. For example, in November, 1985, the Department of Energy commissioned the Hanford Laboratory to develop a compact nuclear reactor which could serve as the power source for a laser and other types of space-based weapons. The Los Alamos and Sandia Laboratories were the first to carry out complex scientific-research work to develop beam weapons. The Livermore Laboratory developed a nuclear fusion device using lasers and a supercomputer providing the capabiltiy to model a nuclear explosion.

The so-called commission on the "use of computers for the leadership of combat operations," formed in the spring of 1985, is engaged in SDI programming support. It has already implemented ten research programs at a cost of 1 million dollars each. The results of this research has key importance for plans to militarize space, since, as the deputy director for space research of the Federation of American Scientists, C. Pike, announced, "Until the issues of programming support are solved, it is premature to invest large resources in the SDI apparatus." 21. The Massachusetts Institute of Technology, having received contracts totalling 260 million dollars in the 1986 fiscal year in comparison with 60 million dollars the previous year, stands in first place among the higher educational establishments working on SDI orders. Now 16 per cent of all federal expenditures for university conducted RDT&E (in 1980 it was 10 per cent).

Large appropriations for work in various areas of electronics have been characteristic for the investment structure in military RDT&E in the 1980s. According to French economists' information, 88 per cent of the resources appropriated for RDT&E within the SDI framework are directed toward these goals, whereas for civilian aircraft construction the corresponding indicator is 33 per cent, for missile construction it is 45 per cent, and for satellite construction is is 60 per cent.

The system of scientific-research organizations in the U.S is tied together through the purposeful distribution of government orders to conduct military-space RDT&E. The main directions in the work of these organizations are the development of "Star Wars" weapons. The integration of science with production occurs within the limits of scientific-industrial consortiums, developed under the government's aegis. Three such consortiums were formed in the first half of 1985 alone. One of them, which includes State University New York, the U.S. Naval Research Laboratory, and General Electric Corporation, has been

commissioned to develop and produce new semiconductor materials, components for laser and accelerator weapons, and a rapid speed electron device. Two others are engaged in the development of powerful energy sources and new computer technology for the SDI program.

The main developers and producers of space armament are based in a very limited number of U.S. states. Approximately 95 per cent of the contracts granted by SDIO fall to five states in all: California (45 per cent), Washington (22), Texas (13), Alabama (10) and Massachusetts (5). There is nothing astonishing in this: senators from four of these states participate in the Senate Armed Forces Affairs Committee, and the lobbyists of military-industrial corporations act in the Defense Appropriations Subcommittee within the Appropriations Committee of the House of Representatives.

The largest aerospace corporations, standing out as the main SDI contractors, have developed the most active lobbying activities. All of them have a sufficient number of confidential agents in Washington, including those financially registered with congress. They regulary make large allocations to political action committees created to finance pre-election campaigns.

The obtainment of the lion's share of SDI orders by California corporations is explained by the fact, that their lobbyists are found in the U.S. government. Among them is U.S. President, Reagan, who prior to the election to this post, was the governor of the state for eight years and maintained close connections there with large military businesses, and also Secretary of State, G. Shultz, and Secretary of Defense, C. Weinberger, who worked previously for the Bechtel Corporation (located in California) which produces military and industrial equipment.

On the other hand, the California military industry was ready, to the greatest extent, to implement SDI orders, since it traditionally has received large contracts from the Pentagon for many years. According to the journal BRITISH BUSINESS, California military-industrial corporations receive 22 per cent of all Pentagon orders, 30 per cent of the government appropriations for RDT&E and 37 per cent of the resources allocated to implement NASA programs.

The main enterprises and research centers developing space weapons are concentrated in the western and southern U.S. in direct proximity to the experimental nuclear test range in the area of White Sands (New Mexico). This area, and also the atoll Kwajalein (Menshikov) in the Pacific Ocean have been officially settled on in the ABM Systems Limitation Treaty as the only place where the U.S. can test antimissile defense weapons. The conduct of experimental nuclear explosions on the test range in Nevada is actually a violation of the treaty, since X-ray laser technology with a nuclear pump is being developed during them, which is an organic part of a space-based ABM system.

Stemming from the interests of the VPK [military-industrial complex] and the postulations of "Reaganomics," above all, the U.S. is developing a national economy and scientific-technical base for implementing the SDI program.

As a result of the implementation of plans to militarize space, "star complex" has formed its own family within the American VPK, consisting of a narrow circle of main scientific and industrial contractors for the SDI program and the leaders of the state administration, the military and the propaganda apparatus connected with them. The WASHINGTON POST newspaper wrote concerning this event; "The 'star complex' hopes to protect this new business from any threat, including political attacks and the opposition of skeptics, etc."

The sharp increase in the influence of the VPK in the United States inevitably will lead to the strengthening of its influence on the country's foreign policy. The same newspaper reported, that in 1988, for each 100 dollars of investments in civilian areas of the U.S. economy, 87 dollars of capital investments will go to the military sector (in comparison with 38 dollars in 1980). "The VPK's influence," noted the WASHINGTON POST, "necessitates the issue to be addressed; is it not formulating U.S. foreign policy instead of serving it?"

The evolution of the international functions of the U.S. modern VPK is apparent in their attempts to subordinate the economic and scientific-technical potential of Western European countries and Japan to the work on the SDI program. Eighteen developed capitalistic governments obtained specific proposals on this score. But Washington is counting primarily on its main "strategic allies" in trying to line up several directions in the Trans-Atlantic military-space cooperation.

For the present, Japan, Great Britain, the FRG, Italy and Israel (Table 4) have affirmed officially their agreement to participate in the implementation of SDI. At the same time, France, Canada, Denmark, Norway, Greece, and Australia rejected the possibility of their participation in SDI at the national level, but mentioning however, that private firms can conclude aggreements with the U.S. on an individual basis to develop separate "Star Wars" components and systems.

Japan presents the greatest interest for the U.S. in that it occupies the leading position in the capitalistic world in many areas of scientific-technical progress. In November, 1983, that is literally a half a year after the SDI pronouncement, the U.S. and Japan signed a cooperative agreement in areas of military technology. According to it, contacts of the American nuclear research laboratory at Los Alamos with Osaki University have been increased for more than two years in the area of laser beam study. Japanese representatives are participating in RDT&E with Livermore Laboratory in the research of neutron and laser beams. The leaders of a number of large Japanese industrial corporations, not waiting for a government decision, have signed contracts to carry out SDI work. However, the companies of Mitsubishi Electronics, Toshiba, Hitashi, and several others have announced that before undertaking any kind of steps, they will wait for an intergovernment agreement, which to a lesser extent, will give them the opportunity to import U.S. technology and equipment developed within the framework of SDI. Misgivings are understandable: the question is, to whom will the results of the research, financed by the United States, but carried out by Japan belong?"

TABLE 4

U.S. ALLIES' PARTICIPATION IN SDI

| Country | Official Document | U.S. areas of Interest | Developing companies | Contract size |
|---|---|---|---|---|
| Japan | Cabinet of Ministers' decision of 9 September, 1986 | High energy lasers, supercomputers, fiber optics, composite materials, ferrite coatings for aircraft, guidance heads for portable missiles | Toshiba, Mitsubishi Fuji, Nippon Electronics, Hitashi, TDK, Nikon, Nippon Telegraph and Telephone | -- |
| FRG | Principal joint agreement between the FRG and U.S. An Agreement from 27 March, 1986, on the participation of West German firms, research establishments, and other institutions in SDI-connected research in SDI-connected research | Stabilization and laser guidance systems, electrotromagnetic guns, target identification and tracking systems, chemical lasers for short-range PVO systems | Messerschmitt-Bolkow Blohm, Siemens, Dornier, Dynamit Nobel, Rheinmetall | Up to 50 million dollars for the next five years |
| Great Britain | Memorandum of Cooperation, signed with the U.S. on 5 December, 1986 | Beam weapons, optical components, computer programming support technology, electro-magnetic gun devices, energy units for space platforms, combat operations control systems etc. (18 areas in all) | British Aerospace, Pelkington, Dunlop, Rolls-Royce, General Electric, Marconi, Plessey, Softuz Sense Lodjica | 5 million pound sterling in 1986 |
| Italy | Memorandum of Cooperation, signed with the U.S. on 19 September, 1986 | New composite materials, technologies using IR and laser beams for military purposes, thermographics, computers | Agusta, Aeromacchi, Aeritalia, Silena, Elettronica, Galileo, FIAT, Montedison, Finmecchanica | -- |
| Israel | Memorandum of Cooperation, signed with the U.S. on 5 March, 1986 | Electromagnetic guns, compact laser units, space-based sensors, kinetic energy weapons | Israel Aircraft Industries, ELOP, Tadiran, Sorek, Israel Military Industries, Teknion, etc. (30 companies in all) | Up to 150 million dollars in the first stage |

The declaration of the "father" of the hydrogen bomb, E. Teller, in a interview with the YOMIURI newspaper added fuel to the fire for the opponents. "If the cooperation of the Japanese in SDI research is not accompanied by financial participation," he said, "then all the new technological developments will belong to the U.S."

Great Britain, having signed the "Memorandum of Cooperation" with the U.S. in December 1985, was the first in the European continent to harness itself to the "space team." However, in spite of the humble requests of Great Britain's former Defense Minister, M. Hazelton, for a guarantee of a share in the SDI program totaling 1.5 billion dollars for British companies, the American side refused to give any kind of firm promises. This required the minister to declare; "The British government is not about to invest additional resources in the SDI program if it cannot be guaranteed that British enterprises will receive contracts for any kind of specific price within the limits of the program."

Then the British aerospace industry attempted to coordinate negotiation activities with the U.S. in the specially formed "clubs of manufacturers" in this or any sphere. But here the Pentagon found opposition. The club of companies, producing for example, construction materials and headed by M. Luis, an employee of the Westland firm under contract by the American transnational corporation United Technologies, was not without American influence,

Consequently, for the time being, the general value of the contracts between the U.S. and Great Britain for the "Star Wars" program is purely a symbolic sum, and as British economists state, it is doubtful whether their size will significantly increase, at least until SDI enters into the "star" weapons production stage. At the same time, the Pentagon retained for itself the right to check and to keep the activities of the British subcontractors secret.

Somewhat later, the FRG, which signed an agreement with U.S. in March 1986, for West German firms and institutions to participate in SDI research work and a general technology exchange, joined the "Star Wars" program at the national level. After fierce debates occuring in the Bundestag between the government and opponents, the texts of both agreements were published. It follows from their diffused wording, that the right to control the export of scientific goods from the FRG was given to the U.S. The well-known West German journal STERN wrote about this event: "The FRG is now the 51st state of the United States. This is only bad in that its citizens cannot elect the president, on whom their fortune depends."

Being fed by the transoceanic promises of mythical technological benefits, Italy decided to participate in SDI. The cabinet of ministers is permitting Italian firms to compete for "Star Wars" contracts. However, the first results of this battle are discouraging. Only four proposals from almost 100 by Italian firms presented to SDI were selected.

The signing of the "Memorandum of Cooperation" in May 1986, between America and Israel, tying Tel Aviv into the implementation of SDI, was evidence of the strengthening of the aggressive American-Israeli alliance. Prior to the

conclusion of this agreement, Israel sent 30 technical designs to the Pentagon which could be used to develop space weapons. In comparison with other countries, it by choice agreed to take upon itself the matter of expenditures for cooperation in the area of military-space RDT&E and moreover, a close connection exists between the Israeli military industry and the American VPK: the size of subcontract work in Israel from American contracts was almost 22 million dollars in 1985. The Israeli newspaper GAAREZ, in extolling the new stage in "strategic cooperation" wrote: "With the help of the friends of Israel in America, SDI can become the most important program which the two allies can ever carry out."

The initial results of the Trans-Atlantic military-space cooperation are not very comforting for U.S. allies. They not only have not received any kind of large orders, but are heavily dependent on the decisions of Uncle Sam. A report of the Federation of Scientists, prepared upon the request of the American congress' House of Representatives has been published. It stated, that West European firms received only 0.1 per cent of the resources allocated in the U.S. for the development of antisatellite weapons in the period 1972 to 1985. Foreign specialists estimate the prospects of their participation in SDI to take the following form: the general appropriations sum for the program the period from 1986 to 1990, will be 30 billion dollars (100 per cent); with this, Western European countries hope to receive 3 billion dollars (10 per cent), in actuality they may receive 0.03 billion dollars (1 per cent), but only 0.03 billion (0.1 per cent) has been reserved for them by the "fathers of Star Wars."

Approximately half of the designs of the SDI program fall under the influence of Article IX of the Soviet-American Treaty on the Limitation of ABM systems. The treaty forbids ABM systems or their components to be sent or deployed in third countries. Yet, 33 per cent of the SDI budget is directed at the development of technologies which not one of the West European firms possesses. Thirteen per cent of the resources are directed for research able to yield rapid commercial output. However, it is not likely, that the U.S. Congress will agree to include the potential competitors of American firms in them. Finally, only 3 per cent of the resources are appropriated for organizational-administrative expenditures and the upkeep of U.S. laboratories and research centers.

SDI advocates are trying to justify its implementation not only by fabricating the "Soviet threat," but by reassuring the American public of promises concerning its positive effect on economic development and the employment of the work force. However, in actuality, the implementation of the "Star Wars" program will impact negatively on the economies of not only West European countries and Japan, but also on that of the United States. SDI will not be able to impart momentum to American economic development, since this same program will interupt capital investment. In the wake of a huge deficit in the balance of payments and an astronomical national debt, the U.S. Congress is making an attempt to reduce the expenditure part of the budget. The president's requests to finance SDI are subject to severe cutbacks. But nevertheless, it remains one of the most ponderable factors of the unproductive expenditures of national resources.

Economic history also discloses the clear inverse relationship between the size of government military expenditures and the economic growth rate.

SDI advocates affirm, that its implementation will lead to a sharp race in the area of newest technology able to be used both for military and civilian purposes. A special subunit was even created within SDIO to "study" the non-military use of SDI technology to advertise this concept. However, the same Western economists acknowledge, that military-industrial developments very seldom find civilian application. In connection with this, it is difficult not to be in agreement with the conclusion of the Council on Economic Priorities (a New York consulting firm), that SDI is a "great celestial feed trough" and the possibility of using new technologies for peaceful purposes is a "hollow sound" in order to mobilize the peoples' support for this program.

Finally, the implementation of SDI will not lead to a significant increase in employment, since at the present stage in the scientific and technical revoluition, the growth in military production is occurring along the lines of increasing its technological capacity and consequently, improving the scientific-technical level of the workers engaged in it. Therefore, even an increase in expenditures for military purposes by an order of magnitude will not guarantee an adequate increase in the workers' positions.

As the foreign press testifies to, the development and deployment of space weapon systems by the U.S. will not only lead to a new turn in the arms race and complicate the world political climate, but it also will lead to the further militarization in the international relations between capitalistic countries. The structural deformation of the U.S. economy, as a result of the implementation of the aggressive plans to militarize space, will lead to the aggrevation of social-class antagonism, degrading the position of the people.

The representatives of the U.S. scientific and business world realize this all the more. More than 6,600 American scientists and technical specialists, including 15 Nobel Prize laureates, announced their wishes not to take part in the "Star Wars" program. Even at the Massachusetts Institute of Technology, which occupies first place in the list of institutions working on Pentagon contracts, 116 professors and instructors came out against SDI, including 42 per cent of the workers on the physics faculty and 32 per cent of the mathematics faculty. "I consider the SDI program to be 'technically unrealiable'" announced one of the participants in a protest campaign against "Star Wars," a physics professor of this institute, F. Loy, "SDI represents an attempt to fool the entire country."

The interests of peace and the safety of all peoples, do not correspond to the build-up of the military-industrial preparations for conducting a "Star War," but rather to an agreement to limit and reduce armaments and ban the militarization of space. The Soviet Union and all peace-loving people are subsequently fighting for this. "If it is possible for the Americans to draw the world into a space arms race," announced M.S. Gorbachev, "this for sure will lead to the maximum risky destabilization of the entire military-strategic situation. The threat to mankind has acquired qualitatively new deadly parameters. No one has the right to close their eyes to this."



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FRANCE (A MILITARY-GEOGRAPHIC DESCRIPTION)

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 81-89

[Article by N. Voronov, A. Isayev; "France (A Military-Geographic Description"]

[Text] The French Republic is one of the largest capitalist countries with influence in international affairs both in Western Europe and in the world at large. It is made up of metropolitan departments as well as five overseas departments: Guadeloupe, Guyana, Martinique, Reunion and the St. Pierre and Miquelon Islands; and five overseas territories: New Caledonia, French Polynesia, Mayotte, Wallis', and Horne (Futuna) Islands.

France has been a member of NATO since 1949, the West European Union since 1955, and the European Economic Community since 1957. It is also a member of the Organization of Economic Cooperation and Development and the International Monetary Fund.

France was an active NATO member up to the early 1960s, however, as a consequence of a rather sharp controversy in 1966, France withdrew from the military organization of the North Atlantic Pact and assumed a special position within the bloc. France created a strategic national nuclear force, a revised military doctrine and announced its denial of absolute subordination to the U.S. on defense issues.

At the same time, departure from the NATO defense organization did not spell a complete break in relations with the bloc countries; as in the past, components of French forces continued to take part in NATO maneuvers and training exercises in order to rehearse joint actions, it is cooperating in the production of weapons and military technology, and French specialists are cooperating in defense standardization, etc. The fundamental point of French policy lies in a strategy of "restraint and deterrence," formulated at the beginning of the 1960s and supported by national strategic nuclear forces. Simultaneously, the idea of "Atlantic Solidarity" continues to gain strength. The linkage of France with NATO is viewed as a decisive precondition to her security, and her armed forces are considered as a basic NATO reserve force.

In Paris, the concept of the so-called "broadened security zone" put forward in the mid-1970s, is still maintained. According to this, France is a nation with global responsibilities whose vital interests are not bounded by territorial limits, but include all Western Europe and adjoining regions. Beyond this area, the French intend to provide limited aid to their allies. In pursuit of this policy course, the politico-military leadership continues to strengthen its armed forces, primarily its strategic nuclear forces.

PHYSICAL GEOGRAPHIC FEATURES. France is the largest of the Western European countries with an area of 551,600 km$^2$. National territory extends north-south a distance of 973 km and east-west for 945. Its land borders extend 2,800 km and its coastline is 2,700 km (Fig. 1). The republic is bordered in the northeast by Belgium and Luxembourg, on the east by Germany, Italy, Switzerland, and Monaco, and in the southwest by Spain and Andorra. Its coasts border on the Atlantic Ocean and Mediterranean Sea.

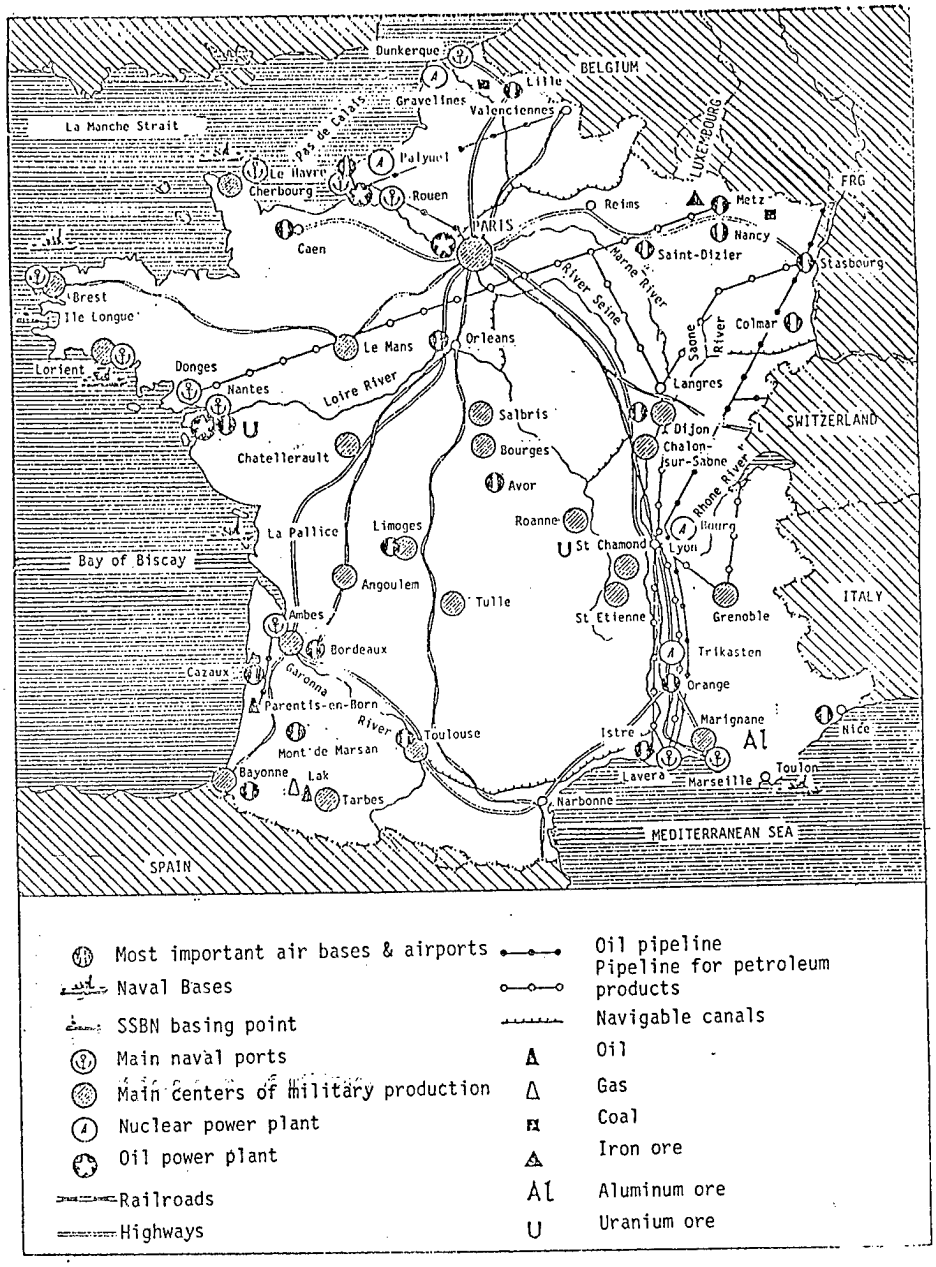


Figure 1. Principal Elements of French Infrastructure.

The average height above sea level in France is 342 m; more than one fourth of its area is less than 100 m above sea level, approximately one third lies between 100 and 250 m, and barely 7 per cent is above 1,000 m above sea level. Low lying regions are spread along a wide belt along the north, west, and southern coastal areas of the country. The shoreline for the most part in these areas is sand dunes, marshy in places, and in the Mediterranean, dotted with lagoons.

The central region includes a medium-height mountain range (the Central Massif, whose highest peak is 1,885 m); in the northeast and north are the Ardennes and Vosges Mountains, and in the southeast, the western Alps, which boast the highest point in France, Mont Blanc (4,807 m). A considerable portion of the range is covered by glaciers. The Alps are marked with gaps and tunnels which afford transportation and communication. In the southwest, along the border with Spain, are the northern slopes of the difficult-to-cross Pyrennes (highest peak is 3,404 m).

The climate of most of France is marine, moderate and with warm summers (average July temperatures 16-20$^0$C) and mild winters (+5$^0$C. Moving eastward, the climate assumes a continental flavor. In the southern region, it is characteristically Mediterranean. The natural vegetation has been changed by agriculture. Forests made up of oak, beech, pine, and birch cover about 20 per cent of the territory. The country's river system is well-developed, much of which is navigable. The majority of rivers are connected by navigable canals into a single system.

POPULATION AND GOVERNMENTAL STRUCTURE. In population size (55.5 million at the beginning of 1985), France is the fourth largest country in Western Europe. Mean population density is about 100 persons per square km. Seventy five per cent of the population lives in cities, about 16 per cent in large cities. National ethnic makeup is virtually homogeneous. In addition to French people (93 per cent), there are several nationalities and national minorities in France (Alsatians, Flemings, Basques, Corsicans and others); also, about 4.5 million foreigners live there (including foreign labor): Algerians, Spaniards, Italians, and Portugese. The overwhelming majority of church goers is Catholic. The number of economically active persons is about 23.5, including 20.5 million wage earners. The remainder are unemployed.

The capital of the country is Paris (about 2.2 million reside within the "official city boundaries" and another 10 million in "Greater Paris." Among the largest French cities are Lyons (1.2 million); Marseilles (1.1 million); Lille (936,000; Bordeaux (640,000, and Toulouse (541,000). Administratively, France is broken down into 96 departments, composed of 325 districts.

France is a bourgeois republic headed by a president, according to the 1958 Constitution. He is chosen by a general direct election for a 7-year term and is vested with sweeping authority; he names the prime minister and members of the government; he presides over sessions of the Council of Ministers, Council of Defense, and the Security Committee; he is the Commander-in-Chief of the Armed Forces, and he is empowered to announce and establish emergency conditions.

The highest legislative body is the 2-chamber Parliament. The lower house, the National Assembly, has 491 deputies elected for a 5-year term; the upper house, the Senate, has 318 senators serving 9-year terms such that every three years one third of the Senate is new. Executive power resides in the President and Council of Ministers, which includes the Prime Minister, ministers, and state secreatries.

Several parties and political groups function in the country. The French Communist Party was founded in 1920, and numbers more than 600,000 members; it supports the interests of the working class and has influence in many democratic organizations. The French Socialist Party which has existed since 1905, was reorganized in 1971. The lower bourgeois level of urban and rural people makes up its 240,000 membership. The Union for French Democracy is a federation of bourgeois parties and groups of a right-of-center character (the Republican Party, the Center of Social Democrats and the Radical and Radical Socialist Party) was organized in 1978, and represents the interests of the upper- and some of the middle- and lower-class bourgeoisie. It numbers about 220,000 members. The Union in Support of the Republic (more than 850,000 members), is a bourgeois party founded in 1958, by the adherents of deGaulle. Its social support comes from the upper and middle bourgeoisie and the nationally opinioned part of the lower class. Other parties of varying nature also take part in the political life in France.

THE ECONOMY. France is a highly developed industrial/agrarian country. By size of its GNP and industrial productivity, it claims fourth place in the capitalist world. Its GNP breaks down as follows: industry share is 28.5 per cent; agriculture 4 per cent; and construction, more than 6 percent.

Foreign trade plays a large role in France's economy: the specific portion of the GNP attributable to exports is 20 per cent, with imports 21.5 per cent. About 60 per cent of the foreign trade is with Western Europe. Imports consist of minerals and petroleum (25 per cent) as well as machinery and equipment (24 per cent). The country primarily exports manufactured goods, chemicals, and agricultural products. The export of arms and military technology, in which France trails only the U.S., plays a very important role. The characteristic feature of the French economy is a highly developed banking system. In terms of the level of concentration of financial capital, France has outstripped the U.S., Germany, and Japan.

The country is devoting attention to strengthening and developing its scientific and technical potential. About 2 per cent of the GNP is allocated for carrying out RTD&E. By this indicator, France stands apart from the other capitalist countries, and the government is planning to increase this to 2.5 per cent by 1990, and at the same time, a significant part of the allocated resources are being directed for conducting RTD&E for military purposes.

In the first half of the 1980s, the increasing crisis conditions and the tight structural rebuilding of the economy, slowed the rate of economic growth. Between 1980 and 1985, the average annual GNP growth was 1 per cent, compared with 5 per cent over the previous 5-year period. The budget deficit and the country's foreign debt grew sharply and the negative balance of payments increased. Unemployment rose to record levels. To improve the economic

situation, the government instituted a policy of "austere economy," which, while responding to the interests of the ruling class, actually aggravated social conflicts and increased the growth of the numbers of unemployed.

A natural resource base to strengthen the economy is quite limited. Energy sources from useful minerals are bituminous and anthracite coal and natural gas and oil; among the metals, the most important are iron and uranium ore and bauxite. There are also some small deposits of lead, zinc, tungsten, and other metals. The country's underground is rich with potassium, sodium chloride, sulphur, and flourspar. Annual recoveries of minerals on average are: coal, about 18 million tons; oil, about 2.5 million tons; iron ore, 15 million tons; bauxite, 1.7 million; natural gas, 7-9 billion $m^3$, and uranium ore, 3,500 tons. In all, French specialists acknowledge that their own natural resources do not satisfy the country's needs, therefore, its economy is dependent to a large degree on foreign sources of raw materials.

Despite the complex economic situation, the politico-military leadership is intent on strengthening the military aspects of the nation. Defense expenditures in the period 1981-1985 grew by a factor of 1.5 and now comprise about 4 per cent of the GNP. These outlays make France the fourth largest in the capitalist world. In 1986 alone, the defense ministry was authorized 195.3 billion francs.

INDUSTRY. About 5 milion workers are involved in France's industrial production. A leading role belongs to the manufacturing industry and electrical energy; while the mining industry, in conjunction with the insufficient natural resource base, is poorly developed.

Transport production, radioelectronics, oil refining and the chemical industry are the most important branches of the manufacturing business. The shipbuilding industry has been in critical condition for a long time. Recently, promissing branches have been developed at a rapid pace: machine tool production with digital controlled programs, robots, flexible industrial systems, computers and composite materials.

The French automobile industry is one of the most highly developed in Western Europe. Automobiles (about 3.5 million per year, including 400,000 light trucks) are produced mainly at the national company (Renault) and by private corporations (Peugeot-Citroen). About 1.5 million vehicles are exported annually. The largest plants are located in Soissons, Paris, Rennes, Douai, and Flandres.

About 12 per cent of the work force is in radioelectronics and electro-technology, which comprise almost 10 per cent of the processing industry. This branch of industry is highly monpolized. The leading position is held by THOMPSON-KSF, SIT-ALCATEL, SAZHEM, SII-HONEYWELL-BOULE, SAFT, and ALSTON-ATLANTICA. The rapid growth of this industry branch is due in large part to the military specialization of many of the radioelectronics firms. The main centers of this business are located in Paris, Lyons, Bordeaux, LeHavre, and Corbeil-Essonnes.

The chemical industry (about 12 per cent of the work force, 10 per cent of the value of the manufacturing industry, and 16 per cent of its exports) is also characterized by a high degree of monopoly. The largest chemical concerns have plants in LeHavre, Toulouse, Rouen, Dunkerque, Lyons, and Grenoble. The gross capacity of the oil refining plants is about 150 million tons per year, including secondary refining. At the present time, it is planned to decrease the actual capacity. The main plants are located in the area of the two ports which are reception points for imported oil, LeHavre and Lavera.

Thermoelectric power stations are the basis of electric energy production. In recent years, nuclear powered electrical generating stations took over first place with a total capacity of 39 million kilowatts. France is second in Europe in the production of electricity.

THE DEFENSE INDUSTRY is the most dynamically developing and competitive sector of French industry. For the past 15 years, according to data in the foreign press, the volume of its production in monetary terms has increased by about 6 per cent per year (in constant prices), which is traceable directly to the growth of orders from the French armed forces and simultaneously to a considerable increase in orders for exports. It is second in the capitalist world behind the U.S., both in the value of its output and in the volume of its exports, which amount to about 5 per cent of all France's exports and more than 10 per cent of the supply of arms and military technology in the world. According to the journal ARMS TODAY, France had 310,000 people working in the arms industry in 1983.

The participation, across the board, of the government in arms production (the share of the government sector in arms production and military technology is about 80 per cent of the overall industry value), the export trends (more than 45 per cent of weapons produced are aimed at foreign markets), and the high degree of concentration of the defense industry (8 of the largest companies fill over 70 per cent of defense orders), these are the features of this industry now.

THE NUCLEAR INDUSTRY includes a complex of scientific and production centers which assure a complete technological cycle from excavating ore to production of atomic weapons and nuclear fuel. According to the foreign press, about 30,000 persons are engaged in this branch of industry. All industrial activity is done by one company, COZHEMA. Main plants are situated in Pierrelatte, Marcoule, Le Ag, Paris, and Grenoble.

THE AVIATION AND MISSILE INDUSTRY(1) occupies a leading role among the branches of the French defense industry and second in the capitalist world in terms of the volume of its exports of aviation and missile technology. The largest companies in this industry are AEROSPATIALE, DASSAULT-BREGE, MATRA, THOMPSON-KSF, SNEKMA and others. Aircraft assembly plants can be found in Toulouse and Bordeaux, and helicopters in Marignane. Various types of missiles are manufactured at factories in Saint Medar-en-Zhall (near Bordeaux), Bruges, Salbris, and Celle St. Denis. Production of aircraft and missile engines is concentrated in the SNEMKA factories at Evrieu-Corbeil (near Paris) and Chateirous; TURBOMEKA, in Bordeaux; MICROTURBO, in Toulouse, as well as in the factories of other firms.

More than 130 companies manufacture aerospace and missile equipment.

THE ELECTRONICS INDUSTRY is second among the branches of the defense industry in terms of the number of people employed (more than 50,000) and in the value of its output (20 per cent). The production base is comprised of the plants of the leading government and private companies, such as THOMPSON-KSF, ELECTRONIQUE SERGE DASSAULT, ELECTRONIQUE AEROSPATIALE, SFENA, SFIM, KRUZE, and SOPELEM, the largest of which are situated near Paris. The most important product of this baranch is radio electronics for fire control, communications, and navigation systems.

33. THE ARMOR INDUSTRY, according to foreign defense specialists, is capable of fully equipping the country's armed forces with modern technology and of filling large export orders. It is, in fact, a state defense arsenal, combining the industrial group of ZHIAT and the factories of state and private firms. The leading arsenal is in Rouen where tanks, IFVs and BMRs (armored scout cars) are produced. Other assembly plants are located in Chalons-sur-Saone (light tanks and special vehicle chassis); St. Chamon (APCs); and Marroles-en-Hurepoix (IFV, BRM). The defense arsenals of ZHIAT have set up complex detailed arrangements and links at Bruges and TArbres as well as factories of other companies. The chief scientific research center is at Versailles.

THE ARTILLERY-RIFLE & AMMUNITION branch is the oldest in the defense industry. Artillery and small arms weapons are designed and manufactured in the state arsenals in Bruges, and Tarbres (artillery weapons), Rouen (SAU); St. Etienne (small arms); and Tulle (antiair artillery), as well as at other factories of private firms in Paris, La Ferte-St. Aubin and Tulle (mortars); Kousse and Mulhouse (grenades and small arms weapons); St. Chamon (naval guns); and Bruges (grenades). The production base for ammunition output is comprised of state defense plants and arsenals. These are also produced in private sector factories. Manufacture of explosives, gunpowder and rocket fuel is concentrated exclusively in state factories.

The shipbuilding industry has great experience in building warships. In terms of production volume, it is third in the capitalist world. It employs over 30,000. The industrial base, according to JANES FIGHTING SHIPS, numbers 13 factories, chief among which are the state-operated naval arsenals. The main factories in this branch can be found the Brest (aircraft carriers, guided missile cruisers (CGs), guided missile destroyers (DDGs), and guided missile frigates (FFGs); Cherbourg (all classes of submarines); Lorient (DDGs, FFGs and minesweepers). Private shipyards in St. Nazaire, La Saint sur Mer, Nantes, and others also participate in this branch of the defense industry.
AGRICULTURE. France, the largest producer in Western Europe of agricultural products, completely satisfies its own needs and exports a portion of these products (feed grain, meat, dairy products and fruit).

Agriculture production is structured such that 55 per cent is dedicated to cattle raising and 45 per cent to farming. Cattle raising is widespread as is agriculture for growing grain and foodstuffs. Fishing, gardening and viniculture are well developed also. The annual production of the main agricultural products (in millions of tons) is as follows: grain, about 50;

potatoes, 6; meat, 5.5; and milk, over 30. The annual fishing catch is about 700,000 tons.

COMMUNICATIONS ROUTES AND TRANSPORTATION. A characteristic feature of the transportation system is a very dense network of railroads and highways, navigable rivers and canals. For freight movements, a large role is played by sea, air and pipline transportation. The primary transportation routes reflect a sharply described radial system converging in a single center, Paris.

One of the leading transport roles is played by the railroads (about 33 per cent of freight movements). According to French statistics, the overall extent of useful rail lines is 34,700 km, of which more than 11,000 km are electrified. On the main routes, dual track lines are laid (about 14,000 km) and surrounding the large transportation nodes there are muti-track lines. Density of the rail network consists of 6.2 km for every 100 $km^2$ of territory. By way of comparison, this indicator in Germany is about 12.1 km, and in Italy, 6.2. The great majority of the railroads are in the eastern part of the country.

In 1983, France completed construction of a high-speed rail line from Paris to Lyons (maximum speed of 270 kph). Among the number of other important routes are Paris-Orleans-Limoges-Toulouse-Narbonne; Paris-Tours-Angoulem-Bordeaux-Bayonne; Paris-Dijon-Lausanne (Switzerland); Paris-Mobege- and on to Belgium. The largest rail switching centers are in Paris, Tours, Limoges, Bordeaux, Nimes, Lyins, Dijon, Rouen, and Metz.

The railroads are in excellent technical condition. Dispatchers widely use automated, computer-assisted systems. At the beginning of 1985, rolling stock numbered more than 2,400 electric locomotives, over 2,000 steam locomotives and about 260,000 cars, of which 16,000 are passenger cars.

Shipments of freight by truck exceeds movement by rail, but the share of this has, in recent years, somewhat decreased. In terms of the extent of its road system, France is first in Western Europe, however, in terms of road density and the amount of higher grade highways, France lags behind Germany, Italy, and the UK. There are more than 800,000 km of roads in France, of which about 655,000 km are surfaced. The main expressways have dual-lanes and in particularly congested areas, the roads are six lanes. The main national autoroutes are Paris-Orleans-Poitiers-Bordeaux. Paris-Lille-Dunkerque, Paris-Cannes; Paris-Bonne-Lyons-Orange-Marseilles; and Bordeaux-Toulouse-Narbonne-Orange.

According to foreign specialists, the technical level of France's highways is, on the whole, high, while the roads in the mountainous regions (Alps and Pyrennes) are built with different special engineering technical intensity. In addition, in France, less than for example in Germany, a portion of the highways is reserved particularly for rapid and heavy traffic of trucks and heavy equipment.

At the beginning of 1985, the automotive fleet comprised 24.1 million vehicles, including 22.6 million light trucks.

AIR TRANSPORTATION. The country's airfield network consists of over 740 airfields, seaplane landing sites, and landing fields of all types, of which about 400 have runways longer than 500 m. About 105 of these fields (with runways longer than 1,800 m and with appropriate equipment) are useful for basing and deployment of combat and military-transport aircraft. Paris is the largest center of aviation communications with 3 international terminals and 11 airfields of local designation. Modern airports have been built in Toulouse, Nice, Lyons, Bordeaux, and Marseilles.

The air fleet numbers over 6,500 planes and more than 420 helicopters.

MARITIME TRANSPORTATION plays a leading role in foreign trade. According to Lloyd's register, the country's commercial fleet numbers about 400 ships, with an overall tonnage of 8.58 million gross tons (11th in the world), more than half of which have been in use less than 10 years. A large portion of the tonnage is in oil tankers (4.8 million tons).

France has more than 18 ports where cargo volume exceeds one million tons a year. The largest ones are Marseilles, LeHavre, and Dunkerque. The first two are the main oil and gas importation points.

The technical condition of the ports' repair base is maintained at a high level. In 1980, a dry dock (420 m x 80 m) was placed into service at Brest, capable of accomplishing repairs on large tonnage tankers; Marseilles has the largest dry dock in Europe (465 m x 85 m); while LeHavre has one of the largest floating docks.

Internal water transportation plays a designated part (about 5 per cent) in cargo movement. France is first in Europe in terms of the length of water routes; 8,500 km are considered navigable, of which over 4,600 are canals connecting the major rivers. The main rivers are: Seine, Oise, Rhine, Rhone, Saonne, and Mozelle. The most important navigable canals are Marne-Rhine, Rhone-Rhine, the Southern Canal, and Valenciennes-Dunkerque, etc. Much of the canal system is located in the north and northeast. A large number of technical-engineering complexes have been built along the canals.

France's river fleet numbers 4,800 vessels, half of which were built before 1950.

Pipeline transportation enjoys a 15 per cent share of movement of domestic goods. The length of the oil pipeline and other lines for transportation of petroleum products is 7,700 km, while the main natural gas pipeline system extends 15,000 km. France has built several defense pipelines, which make up a system designated for use of NATO military: LeHavre-Valenciennes (oil), Donges-Metz and Lavera-Lyons-Langres-Strasbourg (fuel), the latter being interconnected. The network of pipelines for civilian use was begun in 1958 with construction of Western Europe's first pipeline, from LeHavre to Paris, serving the main system for supply of petroleum products to Paris and its environs. Now, this pipeline system has branched out to an overall extent of 1,300 km. A second large main pipeline Lavera-Lyons-Grenoble-Geneva extends almost 600 km.

The oil drilling sites or unloading points for imported oil are connected by pipeline with refineries. The main network includes Lavera-Lyons-Strasbourg-Karlsruhe (Germany), and LeHavre-Grandpiux-Parentis-en-Born-Ambes.

The main gas pipelines are those linking deposits with the country's major factories, as well as those mainlines from other Western European countries.

France also has a well-developed system of underground storage reservoirs for oil, petroleum products, and gas, with man-made reservoirs very similar to natural ones.

THE ARMED FORCES(2) consist of ground force troops, air forces, naval forces, and a defense gendarmerie. According to the foreign press, the regular armed forces number about 477,000, and an additional 90,000 in the gendarmerie. There were 393,000 reservists in 1986.

Responsibility for force structure, condition and carrying out of defense policy resides in the minister of defense (or an appointed civilian) to whom an armed forces staff and similar type groups are subordinated. Day-to-day leadership for training and peacetime operations is exercised by a chief of the armed forces staff through the chiefs of staff of the various armed forces branches who is, in fact, in command. In wartime, he is designated chief of the general staff. Today, buildup of the armed forces is being done pursuant to the 1984-1988 force development program.

France is divided into six military districts, each of which consists of two to six military regions (22 in all).

The GROUND FORCES(3) are the most numerous of all the armed forces, with about 300,000 in uniform. By this indicator, France is second only to Germany among the Western European armies. Army elements and units are organized into the First Army and a Rapid Deployment Force (RDF). The First Army consists of three Army Corps and RDF has five divisions. In addition, there are various service and support units within the ground forces. Ground force weapons, according to foreign military specialists, include approximately 1,600 main and light tanks, more than 840 BRMs (armored vehicles), 780 IFVs, 3,020 APCs, 44 tactical missile (PLUTO) launchers, 138 ROLAND launchers, more than 1,500 anti-tank weapons, 18 MISTRAL anti-air systems, more than 750 helicopters, more than 30 army aviation aircraft, and other weapons and military technology.

The AIR FORCES(4) are organized into strategic aviation, tactical aviation, air defense, airlift, training, communications, and POL. The Air Force has more than 550 combat aircraft (MIRAGE-4A light bombers; MIRAGE-3E, JAGUAR-A, and MIRAGE-5F fighter-bombers; MIRAGE-F1 and MIRAGE-200 fighter interceptors; MIRAGE-3R, MIRAGE-3RD and MIRAGE-FICR tactical reconnaissance aircraft, and others); and 114 helicopters (ALOUETTE 2-3, PUMA and DAUPHINE), as well as 18 silos for launching the BRCD-S3 medium range ballistic missile. There are more than 200 transports (C-160 TRANSALLE, NORATLAS, and the BRUSSARD MS-760 and others).

Main air bases are AVOR, ISTRI, CAZEAUX, CREY, KARITA (Orange and MONT DE MARSANS. In addition to these, there are numerous airfields which can be utilized by tactical and transport aircraft.

In terms of equipment, weapons and numbers of ships, the French NAVY is among the first of the navies in the capitalist world. Organizationally, there is a commander of strategic maritime forces and six operational force commanders. The order of battle lists about 350 combatants, cutters, and auxiliaries, including 6 SSBNs, 3 SSNs, and 12 diesel submarines, 2 multipurpose aircraft carriers, a helicopter cruiser, a guided missile cruiser. anmd 14 guided missile destroyers. Naval aviation numbers about 150 aircraft and up to 60 helicopters.

Five naval bases are used by the French Navy: Brest, Toulon, Cherbourg, Lorient, and LaPallice. French SSBNs are stationed at Ile Longue. Additional basing points have been constructed in overseas territories.

Assigning an important assignment on its armed forces, the French politico-military leadership pays particular attention to increasing its combat power. In 1986 alone, France expected to expend 43 billion francs (22 per cent of the entire defense budget) on equipping its forces with weapons and military equipment, overall, France has allocated about 225 billion francs for these objectives in the 1984-88 program. Showing a predeliction for enhancing combat effectiveness with indigenous production, the ministry of defense constantly pursues a policy aimed at modernizing weapons production and military technology, about 13 per cent of the defense budget annually goes to RTD&E.

The leaders of the main political parties in France have repeatedly announced their intention to maintain an independent line in international affairs and to develop better relations with the USSR. What concerns our government, as the Soviet government has repeatedly stated, is that we have stood firmly for cordial relations and cooperation with France in the interest of strengthening peace in Europe and the whole world. Any steps in this direction will receive a positive response and support from the Soviet side.

1.For details concerning the aviation and missile industry, see: "Zarubezhnoye voyennoye obozreniye," No. 1, 1986, pp 84-89. Ed.

2. For details concerning the French Armed Forces, see: "Zarubezhnoye voyennoye obozreniye," No 1, 1985, pp 11-17. Ed.

3. For details concerning the French Army, see: "Zarubezhnoye voyennoye obozreniye," No 6, 1985, pp 29-37. Ed.

4. For details concerning the French Navy, see: "Zarubezhnoye voyennoye obozreniye," No 6, 1986, pp 47-54. Ed.



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USING SUBWAYS FOR POPULATION SHELTERS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 89-90

[Article by Col G. Germanov; "Using Subways for Population Shelters"]

[Text] In wars with the employment of weapons of mass destruction, there is a significantly increasing role for large underground structures such as subways. As is noted in the foreign press, NATO's military-political leadership is planning to use them for military purposes, primarily in support of civil defense.

The first subway in the world was built in Great Britain: in London (1863), Liverpool and Glasgow (1886 and 1897 respectively). In 1892-1894, subways were put in service in the U.S. (Chicago and New York). In the 90s of the last century, the introduction of electric traction in transportation started a definite impetus to develop subways. However, their construction in many of the World's largest cities developed only in the 20th Century.

Foreign subways are classified by their function, as passenger and freight. There are diversified networks of freight subways only in Chicago and London. In several cities, common freight lines have been built to support post offices and large railroad stations. Passenger subways have received preferred development. The largest of these, by length, was built in New York (nearly 400 km with 200 km of tunnels), in London (more than 380 km with over 160 km of tunnels), in Paris (over 200 km) and in Chicago (more than 150 km).

Subways can be laid underground, shallow (from 6 to 12 m) or deep and above ground on tressles. At the present time, there are almost no above-ground new lines being built and the exisitng ones are being converted to underground lines. Surface segments are being laid outside city limits.

During the Second World War, subways were already being used for civilian population shelters during air raids. At the present time, the NATO leadership is planning to use them as collective shelters on an even larger scale. For example, in the FRG, in accordance with a program for civil defense measures, it is planned to build underground structures with dual designations, specifically, subway and city railroad stations which, in emergencies can be quickly converted to shelters for the civil population. For this purpose,

standard designs are being developed for the construction and equipping underground subway and city railroad stations with allowances made for their being used in civil defense (rated at 4,500 persons). Under the standard design, platforms will be used on which will be positioned four-tiered combined beds for resting or sitting (a total of 3,360 places), and there will be two trains (1,140 places for sitting, see Figs. 1 and 2), standing on the rail line.

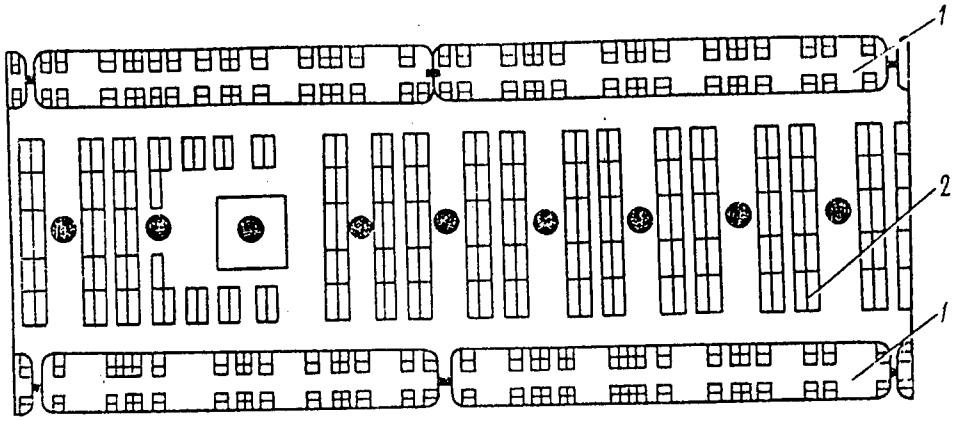


Figure 1. Use of a Subway Station as a Collective Shelter.

1. Rail cars for placing people (places for sitting).
2. Multiple four-tiered beds.

In peace time, the beds will be stored in the stations. The design of the beds makes them easy to set up and transport. In accordance with the design, two 150 or 270 kW diesel generators and a two-week supply of fuel for their operation, will be required for illumination and power for the controls of the shelters' air filtering systems. Water for the shelters will be supplied from the city water supply system. Potable water is stored in the volume of 2.5 liters per person per day. It is planned to build toilets in the shelters.

In foreign specialists' opinion, the air filtering systems must provide a supply of 41,000 $m^3$ of air per hour in the normal operating mode and 81,000 $m^3$ in the shelter mode, (at rate of 0.9 and 1.8 $m^3$ per person per hour respectively). In the shelter, the atmosphere should contain 19 per cent oxygen and 2 per cent carbon dioxide.

In the FRG, over a period of several years, work has been going on to equip the underground stations for use in civil defense. For example, as reported in the foreign press, the equipping of the Stadtmitte station and the underground garage of the Khuptbankhof station in Stuttgard as civil defense shelters has been completed. Work on the construction and adaptation of subway stations to be shelters for the civilian population is being carried out in other NATO countries.

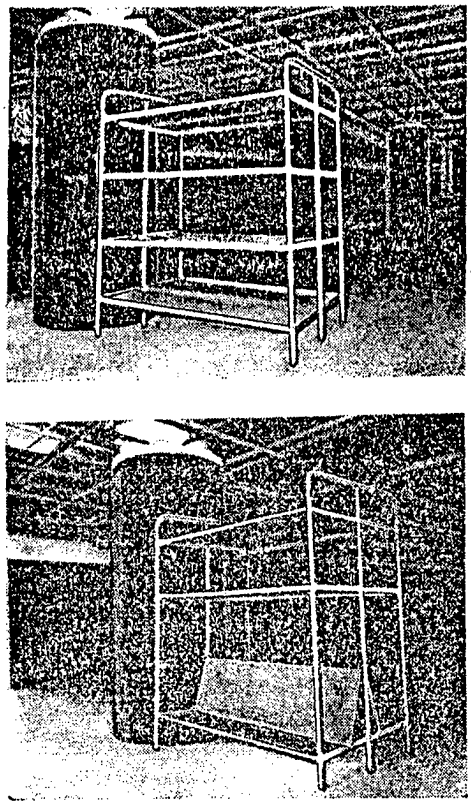

Figure 2. Multiple Four-Tiered Beds in Place for Resting (above) and Resting and Sitting.

In Western military specialists' opinion, subways, in a contemporary war will be widely used for shelters and protection against weapons of mass destruction for the population of large industrial and administrative centers, and also for deploying various types of command posts.



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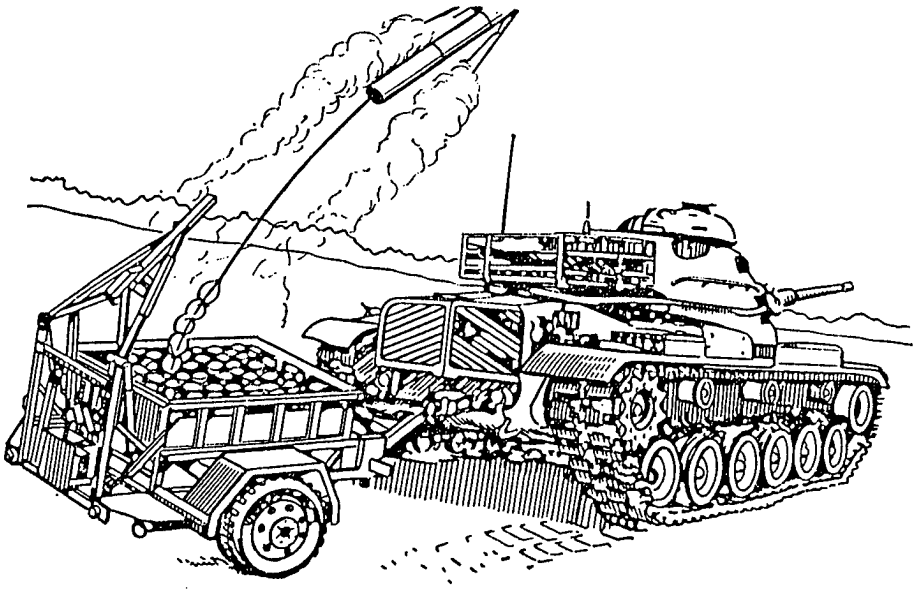
AMERICAN ELONGATED MINE-CLEARING CHARGE

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 91-92

[Article by Col, Reserve, N. Zhukov; "American Elongated Mine-Clearing Charge"]

[Text] The MICLIC (elongated mine-clearing charge), accepted into service in U.S. engineer subunits, is designed for opening thoroughfares for tanks and other military vehicles in enemy mine fields. The new device is a modernized version of the elongated charge being used by the marine corps for clearing anti-landing barriers.

The charge is a series of 1,400 cylindrical blocks of C4 plastic explosive, strung on a steel line. It is contained in and transported on a standard single-axial trailer in a special container and is delivered to the obstacle by a 127-mm solid propellant rocket (see illustration). The latter is launched from short rails reinforced on the after end of the trailer. The rocket is launched from the vehicle which tows the trailer with the charge. Usually, it is an engineer tank. In the future, the prime mover can be the recently developed COV obstacle-clearing engineer vehicle.



The overall length of the charge is 107 m; weight, 850 kg (explosive charge, 795 kg). The length of the rocket body is 1,930 mm; weight, 52 kg.

To breach an obstacle, the charge on the trailer is towed to the obstacle, and the rocket, which delivers the charge to the mine field, is launched at a range of about 60 m from it. After burning up the fuel, it falls to the ground and, after 10 seconds, the detonation of the elongated charge occurs. As a result, mines (scattered on or in the ground) which have been uncovered near it explode or are put out of commission. The dimensions and power of the charge ensure making a cut in the anti-tank or anti-tanktrack mine fields 8-m wide and 100-m deep. As reported in the foreign press, in impossible situations (for example, when the depth of the enemy obstacle is more than 100 m), it is possible to use two charges. The trailers with the charges are towed by a single combat vehicle and are brought to the mine field in succession.

It is noted that the new means of making an opening will be introduced into regular engineer companies of division and corps battalions, and also detached brigades and armored regiments at the rate of two units per company. Series production of the MICLIC charges began in 1986, and in the same year, models of the charge should appear in the training center where specialists will be trained in its combat employment.



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BRITISH CIVIL DEFENSE OBSERVATION POSTS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 87 (Signed to press 7 Jan 87) pp 93-94

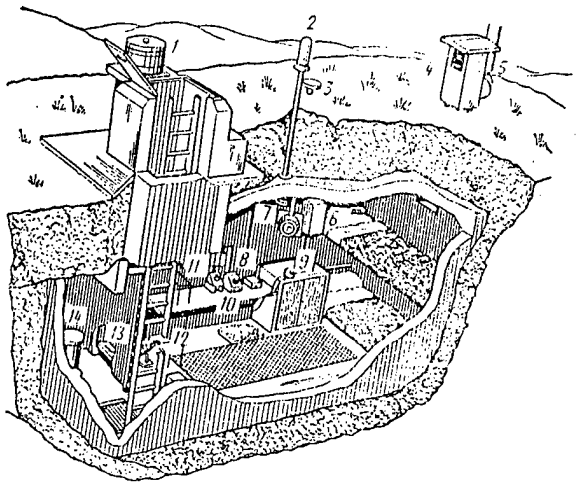
[Article by Col (Reserve) V. Emelyanov; "British Civil Defense Observaton Posts"]

[Text] The main element in the British civil defense system is the so-called corps of observation and warning (Royal Observer Corps). In its assigned missions is the collection and reporting data on nuclear detonations and the radiation conditions in the country (concerning the direction of movement of contaminated air masses and areas of radioactive fallout). The Corps is being built up by volunteers and numbers its membership at about 11,000 persons. Its principal forces and resources have begun to operate in 873 underground observation posts (see illustration), which have been built in all areas of the country.

Each post is an underground steel-reinforced concrete structure 5 m long, 3 m wide and 3 m high, located 6 m in the ground. The posts are operated by 4-man shifts and equipped with the equipment necessary to collect and transmit data concerning the characteristics and yield of nuclear detonations, radiation and weather conditions. Organizationally, three to four posts comprise a detachment, and several detachments, a control group, and information control groups in sectors for observation and reporting.

All information received by the observation posts is transmitted to a control group (there are a total of 25), and then to observation and reporting sectors (a total of 5). Control group staffs and operational centers of the observation and reporting sectors are located in protected structures designed to be occupied by 40 to 50 persons for a long time. They are equipped with a ventilation system and an independent power source. The observation and reporting sector staff works together with one of the control group staffs.

Information gathered by the observation posts is transmitted by the control group staffs and the sector operational centers to 250 reporting control points where it is processed and passed to the population in the form of reported data concerning the radiation condition in the specific areas of the country through the civil defense system's reporting points (a total of 22,000).



Underground Observation Post: 1. Indicator for determining the epicenter of a nuclear detonation; 2. Dosimeter; 3. Indicator receiving device for determining the yield of a nuclear detonation; 4. Ventilator grill; 5. Radio antenna; 6. Radio set; 7. Indicator for determining the yield of a nuclear detonation; 8. Instrument for correlating data coordinates; 9. Headset; 10. Loudspeaker; 11. Radio receiver; 12. Air filter; 13. Storage battery; 14. Bathroom and laundry.



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